

DOCUMENT RESUME

ED 467 838

TM 034 390

AUTHOR Glass, Gene V., Ed.
TITLE Education Policy Analysis Archives, 2001: Numbers 46-51.
ISSN ISSN-1068-2341
PUB DATE 2001-00-00
NOTE 102p.; For Volume 9 Number 23-45, see ED 460 967. "Education Policy Analysis Archives" is an electronic-only journal (see <http://olam.edu.asu.edu/epaa>) covered on an article-by-article basis in "Current Index to Journals in Education" (CIJE). For the articles in this part of Volume 9 in CIJE, see TM 524 454-459.
PUB TYPE Collected Works - Serials (022)
JOURNAL CIT Education Policy Analysis Archives; v9 n46-51 2001
EDRS PRICE EDRS Price MF01/PC05 Plus Postage.
DESCRIPTORS Educational Policy; *Educational Research; Elementary Secondary Education; Higher Education; *Information Technology; *School Choice; *Sex Discrimination; *Standards

ABSTRACT

This document consists of articles 46 through 51 published in the electronic journal "Education Policy Analysis Archives" for the year 2001: (46) "Second Year Analysis of a Hybrid Schedule High School" (James B. Shreiber, William R. Veal, David J. Flinders, and Sherry Churchill); (47) "Knowledge Management for Educational Information Systems: What Is the State of the Field?" (Christopher A. Thorn); (48) "Information Technology and the Goals of Standards-Based Instruction: Advances and Continuing Challenges" (Douglas A. Archbald); (49) "Computing Experience and Good Practices in Undergraduate Education: Does the Degree of Campus 'Wiredness' Matter?" (Shouping Hu and George D. Kuh); (50) "School Choice Policies in the Political Spectacle" (Linda Miller-Kahn and Mary Lee Smith) and (51) "Gender Barriers in Higher Education: The Case of Taiwan" (Ru-jer Wang). (SLD)

ED 467 838

Education Policy Analysis Archives

(Articles 46 thru 51)

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EDUCATION POLICY ANALYSIS ARCHIVES

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Education Policy Analysis Archives

Volume 9 Number 46

November 14, 2001

ISSN 1068-2341

A peer-reviewed scholarly journal
Editor: Gene V Glass, College of Education
Arizona State University

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Second Year Analysis of a Hybrid Schedule High School

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Citation: Schreiber, J.B., Veal, W.R., Flinders, D.J., and Churchill, S. (2001, November 14). Second Year Analysis of a Hybrid Schedule High School, *Education Policy Analysis Archives*, 9(46). Retrieved [date] from <http://epaa.asu.edu/epaa/v9n46/>.

Abstract

The current study examined two independent sophomore cohorts from a mid-western high school that had implemented a multi-schedule system (i.e., traditional, block, hybrid). The purpose of the study was to examine differences among the schedule types, gender, and GPA group on a state mandated standardized test. Analysis of covariance was used to examine the differences. Results indicate that a significant difference among schedule types was observed for only one cohort and for only one test (mathematics-computation). Results also indicate that schedule type did not significantly interact with gender or GPA group. The authors conclude that for these cohorts the type of schedule does not negatively or positively influence achievement.

The reorganization of class scheduling is one current trend in education designed to increase student achievement. One particular reform, called block scheduling, has drawn a great deal of attention over the past decade (Canady & Rettig, 1995). Specifically, questions have been raised concerning the effects of block scheduling on student performance. Survey research has reported that many teachers, students, and parents support the block reform initiative, but survey data only offer evidence regarding the perceived impact of block scheduling. Lacking in the educational research journals are studies that directly compare the effects of schedule types on student achievement. In addition, previous studies have not systematically investigated which students benefit from the implementation of block scheduling. Responding to these relatively neglected areas, this study uses state mandated achievement tests in specific subject areas to examine the overall effects of schedule type and potentially differential effects by gender and

grade point average.

Literature Review

The move to block scheduling has found its way into all types of high schools and some middle schools in the United States and Canada (Canady & Rettig, 1995; Cobb, Abate, & Baker, 1999). For this reason, educators, administrators, teachers, and parents have vigorously argued the merits and pitfalls of block scheduling. Supporting evidence on both sides is often drawn from surveys (Salvaterra, Larc, Gnall, & Adams, 1999; Sessoms, 1995; Tanner, 1996; Veal & Flinders, 1999) or from trend data (Buckman, King, & Ryan, 1995; Edwards, 1993; Holmberg, 1996; Schoenstein, 1995). However, there have been only a handful of comparative studies (Bateson, 1990; Cobb, Abate, & Baker, 1999; Hess, Wronkovich & Robinson, 1998; Veal & Schreiber, 1999), and some of these studies have focused on the outcomes of standardized tests (see also, Lockwood, 1985; Wild, 1998). As with survey and trend observations, results of comparison studies sometimes report benefits for block scheduling, sometimes report no difference, and sometimes report lower achievement than found in traditional scheduling.

Only a handful of studies have examined the effects of block scheduling on academic achievement by gender, again with inconclusive results (Cobb, Abate, & Baker, 1999; Lockwood, 1995). Outside the literature on block scheduling, however, gender differences in achievement are one of the most hotly debated topics in education. In mathematics, for example, Freidman (1989) conducted a meta-analysis of 98 studies, concluding that there was little evidence of gender difference in achievement for students up to the age of ten (e.g., Callahan & Clements, 1984; Dossey, Mullis, Lindquist, & Chamber, 1988). If differences were found at this level, the differences favored females (e.g., Hawn, Elliot, & Des Jardines, 1981; Potter & Levy, 1968). At the middle school level, Friedman found widely mixed results. Some results favored females (Tsai & Walber, 1979), others favored males (Hilton & Berglund, 1974), and some were conflicting (Circicelli, 1967; Fennema & Sherman, 1978). At the high school level, Friedman examined seven studies on mathematics achievement and gender. Five of the seven studies reported males outperforming females with the remaining two studies showing no difference. A host of theories have been offered to explain this trend across grade levels, most of which focus on societal factors and/or school practices (e.g., Brophy & Good, 1974; Fennema & Sherman, 1977; Leder, 1986; Linn & Peterson, 1986; Lee & Bryk, 1986).

In the areas of reading and language, studies of gender and achievement across grade levels suggest a different pattern. Thorndike (1973) analyzed international reading achievement data, finding that high school female achievement was slightly higher than achievement for males but not strong enough to be conclusive. Other studies suggest that males' reading and verbal skills were lower throughout and after high school (Backman, 1972; Droege, 1967; Mondary, Hout, & Luntz, 1967; Rosenberg & Sutton-Smith, 1969; Very, 1967). Hogrebe, Nist, and Newman (1985) using the High School and Beyond data observed that by the time students reach high school, the magnitude of reading achievement differences between males and females is small and accounts for less than one percent of the variation in scores. More recently, differences favoring female students in the areas of spelling, (Stanley, Benbow, Brody, Dauber, and Lupkowski, 1992), reading comprehension (Hedges and Newell, 1995), and writing (U.S. Department of Education, 1997) have been observed.

Purpose

The main purpose of the following study is to compare student achievement on state mandated achievement tests at a unique high school currently using three different schedule types (traditional, block, hybrid). In particular, the data and analyses focus on how scheduling differentially influence achievement in the areas reviewed above: mathematics, reading, and language. An important element in the design of this study was the building of a replication. Two different groups of similar sophomore students took the same achievement test in consecutive years. Specific research questions are:

1. Is student achievement in the three subject areas influenced by the type of schedule?
2. Is student achievement in the three subject areas related to gender?
3. Is student achievement in the three subject areas influenced by GPA?
4. Is there an interaction between gender and schedule type in the three subject areas?
5. Is there an interaction between GPA and schedule type in the three subject areas?
6. Are the results observed on research questions 1-5 consistent across cohorts?

Methods

This study was conducted at a large, four-year high school located in a medium-sized city in Indiana. The student population consists of approximately 1800 is mostly white children from the town and rural areas of the county. In the fall of 1997, the school began a tri-schedule format running at the same time during the school day. The tri-schedule format includes three schedule types: 4 X 4 block, traditional schedule, and hybrid. The 4 X 4 block schedule consists of four, 87-minute daily classes taught for one semester. The traditional schedule consists of six, 55-minute daily classes that meet for the entire school year. The hybrid schedule consists of three traditional and two block classes each day.

Under this format, both traditional and block courses were offered in all subject areas except the performing arts and Advance Placement classes. The total contact time in a block course is approximately 2,000 minutes less than for a year-long traditional course, or 37 fewer class meetings (see Table 1). This reduced contact time per course allows block students to complete up to eight rather than six courses per year.

Table 1
Descriptive information for classes under block and traditional schedules

Schedule Descriptors	Traditional	Hybrid	4X4 Block
Class Time (mins./day)	55	55 and 87	87
Number of Days of Instruction	180	180 and 90	90
Class Time (mins./school year)	9900	9900 and 7830	7830
Classes/Day	6	5	4
Classes/Year	6	7	8
Hours/Day	6.5	6.5	6.5
Credits	12	14	16

State Mandated Test of Basic Skills

The Indiana Statewide Testing for Educational Progress (ISTEP+) is a state mandated test of basic skills and academic aptitude that is administered to all students in Grades 3, 6, 8, and 10 (Sophomores). The academic subject areas tested are reading, language, and mathematics. The sub-areas of reading are *comprehension* and *vocabulary*. The sub-areas of language are *mechanics* and *expression*. The sub-areas of mathematics are *concepts and applications*, and *computation*. In addition to these sub-areas, each area has a total score, which is the composite of the two sub-areas, and a battery score that is a composite of the six sub-areas. For the purposes of this study, Normal Curve Equivalent (NCE) scores and the Cognitive Skills Index (CSI) were used. The NCE and CSI scores are norm-referenced. The NCE scores are based on an equal-interval scale (1-99). Using NCE scores permits comparisons among schedule groups. The CSI describes an individual's overall performance on the aptitude questions of the ISTEP+. This score compares the student's cognitive ability with that of students who are the same age. The CSI is a normalized standard score with a mean of 100 and a standard deviation of 16.

Sample

All sophomores are required to take the three sections of the ISTEP+ in September. The test is administered to the sophomores over a four-day period for three hours per day. If a student did not reside in the state of Indiana the year before or attended a different school in Indiana, the student is still required to complete the test. Due to absences, some students did not take certain portions of the test. Transfer and absent students were not included in the analyses. The sample for this study consists of two cohorts; students who were sophomores in 1997 and 1998. The first sophomore cohort has 332 students and took the ISTEP+ in September 1997. The second sophomore cohort has 318 students and took the ISTEP+ in the September 1998. These two cohorts are independent.

Analysis

All ISTEP+ dependent variables (i.e., test scores) were analyzed using a three factor fixed effect analysis of covariance (ANCOVA), with schedule type, gender, and GPA-group as the independent variables, and CSI as the covariate. Analysis of covariance was used because students were not randomly assigned to schedule types; i.e., there is reason to believe that students' cognitive aptitude varied systematically as a function of their schedule type (Table 2). The dependent variables were the test scores for each sub-area of the standardized test. For each cohort students' cumulative freshman GPAs were divided into four categories (quartiles) based on boxplots of the grade point averages. The first category, "Low," includes those students whose GPAs range from 0.00 to 2.24. The second category, "Middle," consists of students whose GPAs range from 2.25 to 2.99. The next category, "Mid-High," includes students whose GPAs range from 3.00 to 3.59. The final category, "high," includes students whose GPAs range from 3.60 to 4.00.

Table 2

Cognitive Skills Index for Schedule Type

Schedule Type	CSI (1997)	CSI (1998)
Traditional	113.06	109.63
Block	113.11	110.68
Hybrid	116.99	116.03

Table 3
Significant Main and Interaction Effects From Cohort 1 and Cohort 2

	Cohort 1						Cohort 2					
	RDGC	RDGV	LANE	LANM	MAT CA	MAT C	RDGC	RDGV	LAN E	LAN M	MAT CA	MAT C
Gender		X		X	X	X		X	X	X	X	X
Schedule						X						
GPA Group	X		X	X	X	X	X	X	X	X	X	X
Gender * Schedule												
Gender * GPA Group							X	X	X			
Schedule * GPA Group												
Gender * Schedule * GPA Group								X				

X indicates significant at the .05 level
RDGC = reading comprehension RDGV = reading vocabulary
LAN E = language expression LAN M = language mechanics
MAT CA = mathematics concepts and applications
MAT C = mathematics computation

Results

Due to the nature that the sample populations were different, the results are separated into two cohorts to show the replication of the study. This allowed for the results to be analyzed in an attempt to see if the differences or gains were consistent over two years. The results and mean differences of the cohorts on each section of the ISTEP+ are found in Tables 4, 5, 6, and 7. All significant values are reported as $p < 0.05$.

Cohort 1: 1997 Sophomores

Reading

In the reading-*vocabulary* sub-area, males scored significantly higher than females. The difference between the average test scores was 5.702. No other main effects or interactions were significant, i.e., GPA and schedule type. In reading-*comprehension* significant differences were found only for GPA group. High, mid-high, and middle GPA groups all scored significantly better than the low GPA group. No significant interactions were observed.

Table 4
Gender Differences in Test Scores

Cohort 1	Reading Vocabulary		Language Mechanics		Language Expression		Math Computation		Math Concepts & Application	
	Adjust. Mean	Std. Error	Adjust. Mean	Std. Error	Adjust. Mean	Std. Error	Adjust. Mean	Std. Error	Adjust. Mean	Std. Error
Male	68.2	1.5	60.4	1.4	63.9	1.2	67.1	1.1	69.7	1.2

Female	62.5	1.4	67.7	1.3	66.1	1.2	63.3	1.0	66.1	1.1
Cohort 2										
Gender	Adjust. Mean	Std. Error	Adjust. Mean	Std. Error	Adjust. Mean	Std. Error	Adjust. Mean	Std. Error	Adjust. Mean	Std. Error
Male	66.0	1.4	61.0	1.1	66.3	1.0	66.9	1.0	72.0	1.0
Female	60.1	2.0	67.3	1.6	72.1	1.5	62.0	1.4	65.9	1.5

Table 5
GPA Group Differences

Cohort 1	Reading Comprehension		Reading Vocabulary		Language Mechanics		Language Expression		Math Computation		Math Concepts & Application	
GPA Group	Adjust. Mean	Std. Error	Adjust. Mean	Std. Error	Adjust. Mean	Std. Error	Adjust. Mean	Std. Error	Adjust. Mean	Std. Error	Adjust. Mean	Std. Error
High	72.710	1.482	67.726	1.742	72.387	2.413	72.366	1.489	73.478	1.988	78.336	1.405
Mid-High	70.971	1.401	66.562	1.647	65.550	2.066	65.004	1.407	67.302	1.702	69.119	1.335
Middle	70.155	1.878	64.960	2.207	63.823	1.549	65.241	1.886	62.750	1.277	62.997	1.781
Low	59.315	2.192	62.332	2.577	54.431	1.630	57.380	2.203	57.152	1.344	61.168	2.080
Cohort 2												
GPA Group	Adjust. Mean	Std. Error	Adjust. Mean	Std. Error	Adjust. Mean	Std. Error	Adjust. Mean	Std. Error	Adjust. Mean	Std. Error	Adjust. Mean	Std. Error
High	73.494	2.030	70.421	2.206	73.261	1.956	78.360	1.804	72.547	1.724	79.537	1.626
Mid-High	66.464	2.603	59.961	3.034	64.956	2.509	69.758	2.314	65.377	2.211	70.630	1.655
Middle	66.054	1.933	64.347	2.253	64.377	1.864	71.107	1.719	63.061	1.643	66.555	2.227
Low	58.330	1.893	70.421	2.206	53.978	1.832	57.628	1.690	56.932	1.615	59.232	1.736

Language

For the language-*mechanics* sub-area, females scored significantly higher than males with an average difference of 7.28. High GPA students scored significantly better than Mid-High, Middle, and Low GPA students, with average differences of 6.837, 8.564, and 17.956 respectively. Mid-High GPA students scored significantly higher than Low GPA students with an average difference of 11.119 and Middle GPA students scored significantly higher than Low GPA students with a average difference of 9.393. No significant interactions were observed.

Only GPA differences were significant on the language-*expression* sub-area. High GPA students scored significantly better than Mid-High, Middle, and Low GPA students, with average differences of 7.362, 7.125, and 1.985 respectively. Mid-High GPA students scored significantly higher than Low GPA students with an average difference of 7.623 and Middle GPA students scored significantly higher than Low GPA students with an average difference of 7.860. No significant interactions were observed.

Mathematics

Males scored significantly higher on mathematics-*computation* than females. The average difference was 3.811. The traditional schedule students scored significantly higher than block and hybrid schedule students. High GPA students scored significantly higher than Mid-High, Middle, and Low GPA students, with average differences of 6.176, 10.728, and 16.326 respectively. Mid-High GPA students scored significantly higher than Middle and Low GPA students with average differences of 4.552 and 10.150 respectively. Middle GPA students scored significantly higher than Low GPA students did with an average difference of 5.598. No significant interactions were observed.

Table 6
Mathematics Computation for Schedule Type

	Adjusted Mean	Std. Error
Schedule Type		
Traditional	68.119	1.117

Block	64.401	1.144
Hybrid	63.806	1.650

For mathematics-*concepts and applications*, males scored significantly higher than females with an average difference of 3.518. High GPA students scored significantly better than Mid-High, Middle, and Low GPA students, with average differences of 9.217, 15.359, and 17.168 respectively. Mid-High GPA students scored significantly higher than Middle and Low GPA students with average differences of 6.142 and 7.952 respectively. No significant interactions were observed.

Cohort 2: 1998 Sophomores

Reading

For reading-*vocabulary*, males scored significantly higher than females. The difference between the average test scores was 5.898. High GPA students scored significantly better than Mid-High and Low GPA students, with average differences of 10.460 and 12.845 respectively. Middle GPA students scored significantly higher than Low GPA students with an average difference of 6.771. Significant interactions were observed for gender by GPA group ($F(3,293) = 4.505$ $p < .05$) and schedule type by gender by GPA group ($F(6,293) = 3.421$ $p < .05$). The plots of the interactions showed disordinal patterns indicating varying achievement levels as schedule type, gender, and GPA group changed.

On the reading-*comprehension* portion of the test, significant differences were found only for GPA Group. High GPA students scored significantly better than Mid-High, and Low GPA students, with average differences of 7.030, 7.440, and 15.164 respectively. Mid-High GPA students scored significantly higher than Low GPA students with an average difference of 8.134. Middle GPA students scored significantly higher Low GPA students with an average difference of 7.724. One significant interaction was observed—that for gender by GPA group $F(3,317) = 3.875$, $p = .01$. Figure 1 provides a graphic display of the interaction. The interaction indicates that females perform better than males until they reach the Mid-High GPA level. The performance by Low and Middle GPA students is comparable with female scores above those of males. Yet, the performance for females in the Mid-High GPA group decreases dramatically compared to males. The scores then rebound to comparable levels and are slightly below those of males in the High GPA group.

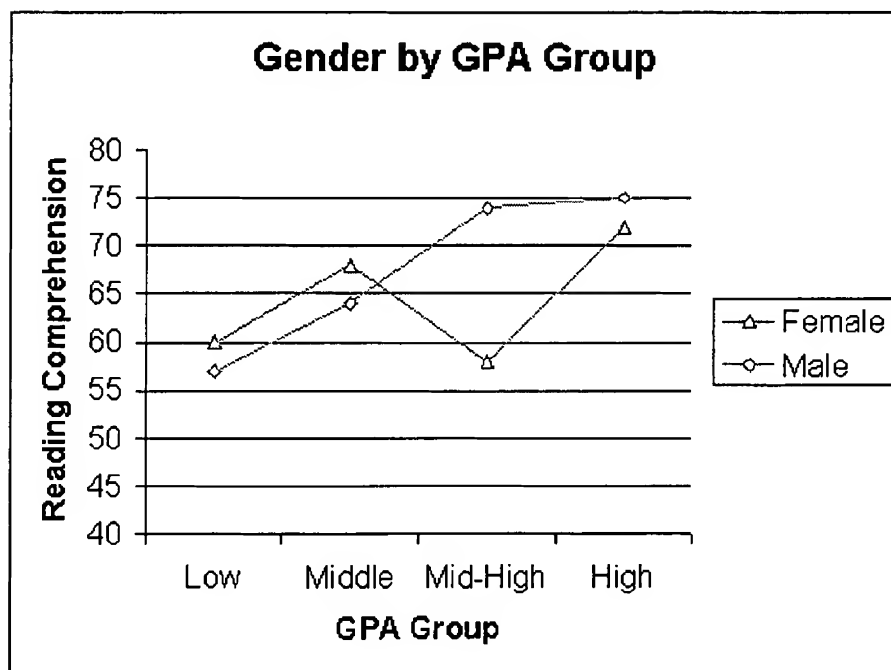


Figure 1. Reading Comprehension Gender by GPA Group for Cohort 2

Language

For the language-*mechanics* sub-area, females scored significantly higher than males with an average difference of 6.346. High GPA students scored significantly better than Mid-High, Middle, and Low GPA students, with average differences of 8.305, 8.884, and 19.283 respectively. Mid-High GPA students scored significantly higher than Low GPA students with an average difference of 10.987, and Middle GPA students scored significantly higher than Low GPA students with an average difference of 10.399. No significant interactions were observed.

For the language-*expression* sub-area, females scored significantly higher than males with an average difference of 5.849. High GPA students scored significantly better than Mid-High, Middle, and Low GPA students, with average differences of 8.602, 7.253, and 20.733 respectively. Mid-High GPA students scored significantly higher than Low GPA students with an average difference of 12.131, and Middle GPA students scored significantly higher than Low GPA students with a average difference of 13.480. One significant interaction was observed for gender by GPA group. Figure 2 provides a graphic display of the interaction, which reveals that males in the Low and Middle GPA groups perform at a lower level than females. The difference in ability is negated with students in the Mid-High and High GPA groups. Females in the Mid-High GPA group perform worse, and subsequently match those of the male Mid-High GPA group.

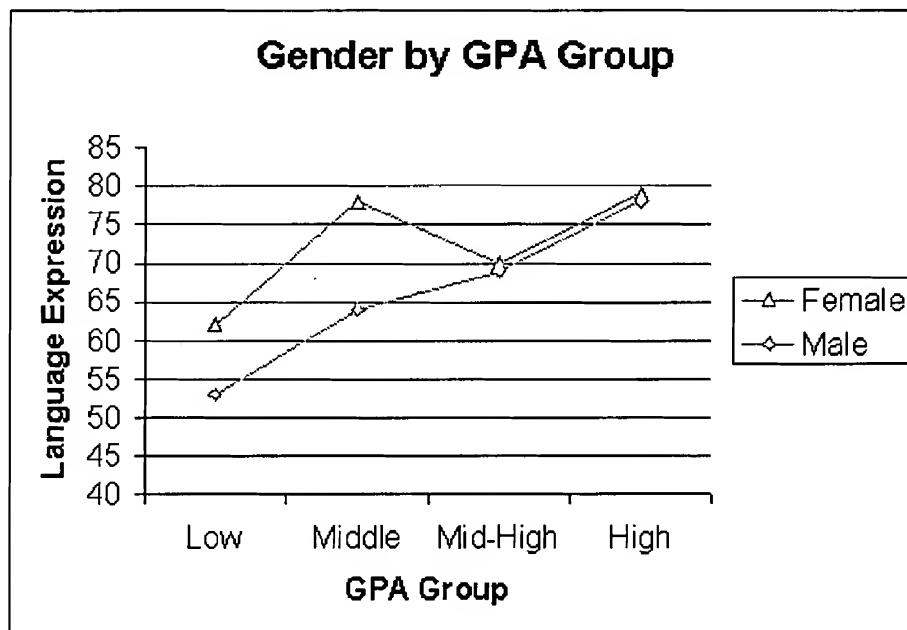


Figure 2. Language Expression Gender by GPA Group for Cohort 2

Mathematics

Males scored significantly higher on mathematics-*computation* than females. The average difference was 4.882. High GPA students scored significantly better than Mid-High, Middle, and Low GPA students, with average differences of 7.170, 9.486, and 15.615 respectively. Mid-High GPA students scored significantly higher than Low GPA students with an average difference of 8.445. Middle GPA students scored significantly higher than Low GPA students with an average difference of 6.129. No significant interactions were observed.

For mathematics-*concepts and applications*, males scored significantly higher than females with an average difference of 6.100. High GPA students scored significantly better than Mid-High, Middle, and Low GPA students, with average differences of 8.907, 12.982, and 20.304 respectively. Mid-High GPA students scored significantly higher than Low GPA students with average differences of 11.398. Middle GPA students scored significantly higher than Low GPA students with average differences of 11.398. No significant interactions were observed.

Discussion

The discussion is organized by research question and focuses on areas related to the covariate used in the analysis. These covariates were chosen because they were accessible in the database, and they answered salient

practical questions that have not been answered in the literature about block scheduling effects on ability level students and gender.

Block scheduling had essentially no positive impact on academic achievement as measured on the ISTEP+. Only one cohort (1997 sophomores) showed better performance across various schedule formats and only on one of the six sub-tests across the ISTEP+ (*math-computation*). Surprisingly, this single difference favored the traditional schedule group.

Schedule Type

Only *mathematics-computation* for Cohort 1 had a significant difference in achievement among schedule types. It is possible that the difference can be attributed to the overall amount of time and the daily class meetings for an entire year. Recall that the block schedule had the equivalent of 37 fewer class meetings. However, the difference was only observed with one of the six tests, and the observed difference was not replicated with the second cohort. The replication failure is particularly noteworthy in that the teachers for the second cohort had another year of the scheduling experience behind them allowing them to become familiar with the block system and make instructional adjustments. Thus, taken as a whole, these findings leave open the possibility that the single statistical signpost result may be an anomaly. Overall, schedule type does not appear to improve or decrease student achievement.

Gender

For Cohort 1, males outperformed females on *mathematics-computation*, *mathematics-concepts and applications*, and *reading-vocabulary*. Females outperformed males on *language-mechanics*. No gender differences were found on *reading-comprehension* and *language-expression*. For Cohort 2 the same differences were observed on *reading-vocabulary* with male students outperforming female students. The vocabulary result was unexpected and originally it was thought the first difference may have been an artifact of the cohort because males have been observed to perform lower than females in reading achievement (e.g., Backman, 1972). The replication seems to indicate that this observation may be more consistent than previously thought and warrants further investigation. The observations for *mathematics-computation* and *concepts and applications* tests are consistent with earlier research on gender inequities at the high school level (e.g., Friedman, 1989). Evidence for the pattern of males outperforming females is disappointing in recent studies such as our own. It suggests that after decades of research, the problem of gender disparity has yet to be solved. Overall, excluding the vocabulary observation, the results are consistent with previous gender difference observations.

GPA

Due to the purposeful categorization of the four GPA groups, the significant differences found in this area are not surprising. It was expected that the highest GPA group would perform significantly better than the other GPA groups. One interesting aspect of the GPA groups was the complete lack of a difference for *reading-vocabulary* for cohort one. A second interesting aspect was the lack of significant difference was between the Middle GPA and Mid-High GPA students in a few cases and across cohorts (e.g., *language-expression*). One could speculate that the involvement in extracurricular activities may influence how the students in the category performed. Those who may need extra time to study may not be getting it at these GPA groups if they are involved in extracurricular activities.

Gender and Schedule Type

The observations indicate that for both cohorts schedule type does not interact with gender and cause differential performance on the tests. This appears to indicate that schedule type does not hinder or assist one gender over the other, though future studies may or may not support this finding. This finding is important if it is to inform policy. Schedule type has not been reported as a factor influencing gender achievement. Decisions whether to adopt block scheduling should not be made based upon perceived performance by gender.

GPA and Gender Interaction

Two interactions for gender by GPA Group were observed for *reading-comprehension* and *language-expression* for cohort 2 only. The interaction appears to be driven by differences in female students performance by GPA group. The male students have a more linear trend by GPA, where as the female student performance fluctuates. The reason or reasons for the fluctuation is (are) unknown and warrant follow up investigation.

GPA and Schedule Type

No significant interactions were observed for schedule type and GPA group indicating that schedule type does not positively or negatively impact one GPA group over another. There have been unsubstantiated reports that the 4x4-semester schedule allows the lower achieving students to perform better since they have fewer courses on which to focus. On the other hand, arguments against the intensity and increased amount of content in a short period of time of the 4x4-semester schedule are unsubstantiated. The results of this study show otherwise. Neither schedule (block nor hybrid) appear to harm, lower, or decrease the academic achievement of students compared to those in a traditional schedule.

Consistency from Cohort 1 to Cohort 2

Table 3 provides a quick graphic view of similarities and differences observed between the cohorts. As can be seen in the table the observations are quite consistent from Cohort 1 to Cohort 2. Out of all the possible changes from one cohort examination to the next only seven were observed. The consistent results provide support for the argument that the different schedule types are not impacting achievement, either positively or negatively, for these students. The consistency also increases ones ability to generalize the results with similar high school population parameters.

Conclusions

The findings of this study are important in several ways. Most importantly, schedule type was not an influential factor in student achievement as it pertained to gender and GPA group. First, the results of this study indicate that schedule type does not interact with gender. This finding informs the debate over block scheduling because it supports the possibility that if other benefits of block courses are found, either achievement benefits in other subject areas or benefits in areas such as student attitudes, then educators may have the opportunity to secure these benefits without increasing whatever gender disparities already exist.

Schedule type, also, does not interact with GPA group. This result informs those considering block scheduling that the type of schedule does not appear to differentially impact students at different academic levels. It seems obvious that a school would not want to implement a program that systematically helps one group of students while at the same time systematically hurts another group. If a school desires to implement block scheduling, gender, academic level, and scheduling should not influence the decision. Rather other items that are more contextual should influence the decision to move to a block or differentiated schedule. For example, with increasing state standards for graduation, the move to a block schedule might allow those college tract students to take more electives such as AP courses, music, art, work study, business, and physical education.

Second, studies like the one we have described can alert parents and educators to gender differences and possible biases that work against large numbers of students. The gender disparities found in mathematics and reading vocabulary achievement signal that more needs to be done to explore the antecedents of these inequities. Moreover, comparing this study with previous research suggests that gender differences in mathematics are persistent, and may thus require even more concerted efforts than are currently in place.

Finally, the observation that achievement differences across schedule type were significant in only one area, mathematics-computation, and for only one cohort suggests variations in the effects of block scheduling across academic skills and subjects is not consistent. Given that it was the only observation for a difference in achievement based on schedule type, the overall results indicate that the schedule type does not influence achievement on these tests. Therefore, those schools considering block scheduling may want to determine other reasons for implementing the schedule. Such reasons may be class flexibility, more classes offered during the year, or attitudes towards having a block schedule. The reader is reminded that only reading, language, and mathematics were examined and the cohort make up. Different results may exist for science or the arts.

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Cambridge University Press.

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Education Policy Analysis Archives

Volume 9 Number 47

November 19, 2001

ISSN 1068-2341

A peer-reviewed scholarly journal

Editor: Gene V Glass

College of Education

Arizona State University

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Knowledge Management for Educational Information Systems: What Is the State of the Field?

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Citation: Thorn, C.A. (2001, November 19). Knowledge Management for Educational Information Systems: What Is the State of the Field?, *Education Policy Analysis Archives*, 9(47). Retrieved [date] from <http://epaa.asu.edu/epaa/v9n47/>.

Abstract

This article explores the application of Knowledge Management (KM) techniques to educational information systems—particularly in support of systemic reform efforts. The first section defines *knowledge* and its relationship to *information* and *data*. There is also a discussion of various goals that might be pursued by organizations using KM techniques. The second section explores some of the fundamental design elements of an educational KM system. These include questions surrounding the unit of analysis, distributed computer resources, and organizational characteristics of successful KM efforts. Section three outlines the benefits that organizations expect to gain by investing in KM. Section four is a case history of the introduction of a district-level data system and the parallel efforts to support the aggregation and reporting of high-stakes educational outcomes for 8th grade students in the Milwaukee Public Schools (MPS) district. Finally, there are some preliminary conclusions about the capacity of an urban district in a complex policy environment to respond to the knowledge management needs of a decentralized system.

Introduction

This article considers the critical role played by the "management of knowledge" in education, and, specifically, in efforts at educational reform. Schools and districts in the United States face mounting pressure to demonstrate the measurable effects of their practices to legislators, parents, the business world, and the public at large.¹ This fact by itself adds to the information management burden placed on the educational system. However, other changes, such as the rise in student mobility and ethnic diversity, have increased the complexity of already complex school data systems. This complexity is rooted in the operational requirements of implementing and assessing instructional interventions and the interactions between racial, ethnic, and socioeconomic characteristics on student learning. The permutations of analytically distinct groups increase knowledge management burdens at an alarming rate.

As growing diversity has been matched by increasing disparities in educational outcomes between a number of

groups—poor and affluent, white and minority, urban and suburban—a patchwork of uncoordinated programs have been introduced at all education levels by a variety of government entities. This *ad hoc* form of policymaking often results in programs that at best do not reinforce one another and at worst actively work to undermine each other. For example, the move to base access to Title I resources on economic rather than academic need was an important shift in emphasis that allocated resources more equitably. Unfortunately, a number of local programs in many urban school districts relied on the annual testing funded by Title I as an important component in assessing overall system performance and often used the data to inform local goals. A more promising response, which has developed over the past decade, has been what is referred to as *systemic* or *standards-based reform*. Systemic reform, according to U.S. Deputy Secretary of Education Marshall Smith, is typically based on state-level reforms that implement more rigorous content and performance standards across grades and disciplines.² Systemic reform requires that curricular material and assessments be aligned with these standards. Preservice teacher education and teacher professional development must also support these goals. Finally, funding, technology, physical plant, and human resources must all be allocated in such a way that each group has equal access to the things it needs in order to succeed. To improve student achievement and to close the equity gap are the ultimate goals of systemic reform efforts, but supporters of systemic reform believe these goals can only be achieved by improving all aspects of the educational system.

Major systemic reform initiatives at the national level seek to strengthen teacher education, reinvigorate the development of high-strength curriculum, and promulgate disciplinary standards. Some of these programs operate under the auspices of the U.S. Department of Education and the National Science Foundation.³ The majority of reforms are state-level initiatives to improve the performance of students in specific subject areas or grade ranges such as elementary reading or middle school mathematics (Armstrong, 1999). Individual districts also engage in reform initiatives that seek to motivate particular schools or groups of students to meet individual standard components. Finally, individual schools and classroom teachers work to develop lesson plans to teach concepts based on grade-level standards. These trends and the consequent emergence of more data-rich environments raise the need for new technologies and new management techniques for coping with complexity. Three technical issues in particular appear to be especially crucial.

First is the problem of accurately identifying policy targets. Identifying the target group and the desired outcomes for a particular reform is necessary if one is to describe, analyze, and locate reform efforts within educational systems. Existing organizational identifiers such as school, classroom, or demographic data are often inadequate to isolate for study or evaluation students or teachers who participated in particular programs or received distinct treatments. The ability to accurately compare analytically distinct groups is vital if one is to assess the impact of systemic reform.

Second is the problem of managing data. It is evident that successful systemic reform will depend on access to and effective use of large amounts of data. This means that the quantity, timeliness, and level of detail of the data needed from decision-support systems will only increase. Proponents of systemic reform point to the importance of a process model and evaluation framework for assessing programs (Clune, 1998). The process of systemic reform must include actors from all levels and it must include an awareness of resources and barriers confronting actors across educational roles. The focus on process also points to the importance of quality indicators. Quality measures might include a detailed analysis of curriculum goals and well-understood, publicly available education standards. High quality instruction demonstrates an alignment between standards, curriculum, and assessment. The difficulty of measuring differential interventions is compounded by the need to gauge the quality and thoroughness of new, robust curricula and to obtain more detailed analyses of student progress.

Third is the problem of metrics, i.e., multiple-choice versus authentic-performance tasks. Demands for more authentic assessments have led to calls for new metrics of student performance relative to standards, as well as an emphasis on measuring a particular student's attainment of individual proficiencies.⁴ The new standards-based approaches have led to the creation of new sorts of testing that go beyond the typical "fill in the bubble" standardized assessments. The introduction of multifaceted testing regimes (including traditional standardized tests, as well as performance- and portfolio-based assessments) both increases the complexity of the individual instruments and creates new requirements for the underlying data systems that must both record and provide an analytical environment for the data. The increasing sophistication of assessment practices calls for a parallel development in the arena of information-management strategies.

The problems described above are the technical aspects of fundamental research questions—What to study? How to aggregate the data? And what are the appropriate measures? As our understanding of the educational process deepens, our technical capacity to collect, manage, and analyze data must keep pace.

This article seeks to apply insights from the growing body of literature on knowledge management (based primarily on research coming out of United States and European business schools)⁵ to the specific case of systemic reform in U.S. education. Knowledge management (KM) strategies can serve as valuable tools for decision makers at all levels of the educational system. In this paper, I focus on outlining the distinctive features of knowledge management,

identifying the characteristics of successful KM efforts and exploring the usefulness of KM for making important educational decisions. I conclude with a discussion of the role of information technology (as a component of a KM system) in the implementation of high-stakes accountability for 8th grade students in one particular urban district, that of Milwaukee, Wisconsin.

I. Knowledge Management (KM): Definitions and Scope

Before considering the characteristics of knowledge management, it is important to note the differences between *data*, *information*, and *knowledge*. A recent article by Laura Empson, which presents the argument that knowledge is a product that is built from data and information, provides the following definitions:

[I]t is perhaps easiest to understand knowledge in terms of what it is not. It is not data and it is not information. Data are objective facts, presented without any judgment or context. Data becomes information when it is categorised, analysed, summarized, and placed in context.

Information therefore is data endowed with relevance and purpose. Information develops into knowledge when it is used to make comparisons, assess consequences, establish connections, and engage in a dialogue. Knowledge can, therefore, be seen as information that comes laden with experience, judgment, intuition, and values. (Empson, 1999)

There is a clear progression along the path in which value is added to data, as context is combined with it to create information. A further transformation occurs when human experience is added to information to make value judgments about, and comparisons of, different information.

The progression from data to knowledge can be seen both as a temporal process in which data, imported into a system's architecture, aggregates individual facts into summaries and averages that are then presented in an appropriate context. In an educational setting, this might be a report of student test performance by grade, ethnicity, race, and gender. The addition of deeper contextual information about local school leadership, particular organizational characteristics, or other less quantifiable factors can be combined with mechanistically generated test-score results to describe variance in outcomes that could not be extracted from the more traditional reports. It is this application of personal knowledge and of well-designed models that differentiates information systems from knowledge systems.

Knowledge Management as the Use of Data and Information

As mentioned above, KM is a follow-up to information management. The bulk of the literature on good information system design focuses on the technologies and processes used to *acquire and manage* data. When describing the breadth of approaches to effective knowledge *use*, a number of authors describe a range of system functions from data management to knowledge creation and application. Information management lies somewhere between the two poles of data management and knowledge management. Another way to think about KM is that it is the use or application of information.

In districts, the student data system provides the core of such a system. However, this focus on information systems and tools for aggregation and on KM as the application of information should not imply some type of computer-based system that is somehow imbued with deep contextual knowledge of the organization. This is not just a question of the technologies employed. An important role is played by institutional culture. For example, a district with a collaborative model of interaction between schools will typically display a far greater capacity to develop robust analyses of school-level processes and needs than a district lacking such a model. Davenport has identified several important questions that may be helpful in efforts to clarify an organization's approach to the use of knowledge management:

Does an organization's culture reward decisions and actions according to how people use and share their knowledge? Or is it content with the widespread use of intuition and guesswork at the expense of organizing people and processes to apply the best knowledge, experience, and skills to projects and tasks? (Davenport & Davenport, 1999)

The Davenports point to the importance of organizational culture in enabling or blocking the use of knowledge. Cultures that support knowledge accumulation and application will be the most effective, efficient organizations. Organizational structures and processes provide a window into the value a knowledge management system will return to any implementer. A willingness to engage in problem-solving processes and share information with "outsiders" is an important resource for enabling knowledge management efforts.

The Objectives of Knowledge Management

One of the important questions that an organization evaluating its effectiveness needs to answer is, What is the goal of this organization's knowledge management strategy? Davenport and his colleagues conducted a study of 31 KM projects across 24 companies. The authors identified four broad types of objectives with different subtypes:

1. Create knowledge repositories— a) external knowledge (competitive intelligence, market data, surveys, etc.), b) structured internal knowledge (reports, marketing materials, techniques and methods), and c) informal internal knowledge (discussion databases of 'know how' or 'lessons learned').

In an educational setting, curriculum aids might be thought of as knowledge repositories. For example, the Milwaukee Public Schools Curriculum Design Assistant⁶ (CDA) is both a source of documentation—standards, learning goals, etc.—and a repository for instructional plans based on this documentation. These lesson plans can be stored in the system and shared with others electronically to provide a knowledge base for a wider audience.

2. Improve knowledge access through a) technical expert referral, b) expert networks used for staffing based on individual competencies, and c) turn-key video conferencing to foster easy access to [geographically] distributed experts.

Examples of this sort in public school education are probably rare, but the Community of Science online database⁷ is a data and communication resource that functions well in education research: it links researchers, research intuitions, and funders together. The purpose of the Community of Science online database is to reduce the barriers for those seeking funding for research, as well as to reduce the difficulty of funders in locating qualified researchers.

3. Enhance the knowledge environment —a) change organizational norms and values related to knowledge in order to encourage knowledge use and knowledge sharing, b) customers may be asked to rate their provider's expertise.

This objective focuses on the creation of a technological environment that will contribute to the social transformation of an organization. Anderson Consulting used this sort of approach to radically shift norms of information sharing and use among its consulting staff (Graham, Osgood, & Karren, 1998; Greengard, 1998). In the consulting business, there are traditionally strong norms about keeping personal expertise personal—it represents a large portion of individual competitive advantage. Anderson Consulting wanted to reverse this behavior and reward those who shared information with other consultants within the organization. The company began to make participation in an online, e-mail-based, problem-solving environment mandatory. Eventually the bar was raised further and pay and promotion were linked to the number, quality, and immediacy of an individual's responses. This approach was draconian, but it was successful in building both a compelling repository of problem-solving information and shifting or overturning a strong norm against sharing information. This approach models an important tool for accumulating and diffusing successful educational practices. The call for methods of replicating successful programs and school initiatives that "beat the odds" could be addressed with a system that improves communication within educational systems.

4. Manage knowledge as an asset— a) attempt to measure the contribution of knowledge to bottom line success. (Davenport, DeLong, & Beers, 1998, pp. 45-48)

While this final KM objective sounds the most compelling, it is also the most difficult to operationalize. Even firms with excellent data-management practices and sophisticated conceptions of return on investment have difficulty assessing the return on intangibles. Learning Landscape⁸ is an example of one such effort in education. This system was an outgrowth of the Connecticut Academy's NSF-sponsored Statewide Systemic Initiative. The Connecticut Academy worked together with the consulting firm, KPMG, to develop a data warehouse environment based on the National Center for Education Statistics' core data elements. The stated purpose of the project was to *transform data into knowledge to improve student achievement and teacher quality*. This project was abandoned after it became clear that the development costs would exceed what most districts would be able to afford. A new firm has been established, EdExplore, which has the same KM goals but is much more limited in scope and has implementation costs in line with district resources. EdExplore remains focused on bringing cutting-edge approaches to data warehousing to the evaluation of student and teacher performance.⁹

These different goals are not mutually exclusive. Davenport states that most projects his team studied were focused on one of these goals, but many had features of the other goals interwoven into their projects (Davenport, De Long, & Beers, 1998; Davenport & Prusak, 1998). In addition, the first three objectives can be seen as constituting a feedback

loop. Repositories must be built. Then, these repositories are only useful if users have efficient access to the knowledge contained in them. Finally, the use of knowledge in an organization will be enhanced by the creation of an environment that supports this use. This *knowledge-friendly* environment will, in turn, demand higher levels of sophistication in the knowledge repository, thus closing the loop.

The fourth goal—determining the return on investment in knowledge management—is closely related to efforts that attempt to determine the return on investment from spending on early research and development. Many analysts have struggled with this vexing issue, which remains only partly addressed. There are so many unquantifiable, human elements in a KM system that it may be very difficult to come up with metrics that are generalizable.

II. Knowledge Networks and Educational Systems

There are several problems that must be faced by any educational system that attempts to create a knowledge management system. The first problem is to determine the appropriate level of analysis the system is designed to support. Another is that of differential access to computing power and the technical and analytical skills of the knowledge consumers within the system. In an educational setting, users representing students, classroom teachers, principals, and district administration should be involved in the design of a system destined to support important instructional and policy-level decision making. It is only by including users at all levels of the knowledge system that designers will have the input necessary to grapple with the problems identified above.

The arguments of the authors cited thus far in support of knowledge management systems provide very little insight into the exact analytical approaches one would use in any particular scenario, since so much depends on the organizational form, sector, or level of analysis. The discussions in the literature focus instead on families of tools designed for pattern detection and predictive modeling. It is important to bring these together with the experience of those working in the specific domain to identify the important dimensions of knowledge in that field, since we have defined knowledge as the application of information in context.

A crucial feature of educational systems is that they are made up of a number of nested systems or organizations. In analytical terms, this can also be described as *levels* or *units of analysis*. In education, these levels range from the federal level, through the state, district, school, classroom, and student levels. Reporting and analytical needs differ from level to level as do the relevant time scales. For example, there are classroom needs for lesson planning and local testing. At the school level, Title I, free lunch, state-mandated testing, and other mandated programs are focal points of data-management issues. The reporting requirements are as numerous as the funding sources at each level of the organization. Analytical needs differ, but are present at every level of the system. A robust knowledge management system must reflect the information and knowledge management needs of all levels. In particular, data must be gathered at a level of aggregation appropriate to the user with the most fine-grained analytical needs.

The Level-of-Analysis Problem

The most common focus of school information systems is on the school- and district-level reports produced by a central information technology department. In the case of school district-level knowledge management systems, one might attempt to implement several KM systems as described above by Davenport. One could argue that schools are groups of professionals with both process and content knowledge. One organizational model used to describe reform-based schools—"communities of practice"—would suggest that they would be more likely to focus on enhancing a knowledge environment (Snyder, 2000; Wenger, 1998). Operating under this model, schools would be less likely to accumulate knowledge for its own sake. They would focus, instead, on sharing knowledge among a group of professionals. This would be consistent with the view that schools are communities of learners. A KM system that supports such behavior would be both a repository of successful practices and a system for conveying positive norms associated with sharing knowledge.

The importance of the level of analysis comes to the forefront of any effort to describe and apply KM principles. For example, district-level functions might include analysis of the quality of the data in the system (this may be in formal terms of validity and/or reliability, as well as of alignment of the metrics in use and the learning or performance standards). District-level analysis might also focus on the curricula that are in use across the district and assess their relative effectiveness. These district-level functions call for nested hierarchies of approaches to systems design that support collection of the relevant data and aggregation of these data to the appropriate level of analysis.

The identification of distinct levels in an organization with different KM needs is even more vital if one considers the increasing demands technology places on individual units in an organization. Boisot argues that the traditional neoclassical economics concept of a linear relationship among the different factors of production fails to adequately explain the returns of knowledge (Boisot, 1998). Boisot points out that as one moves up within an organization, the

number of elements that must be integrated in order to produce a good or service has probably not increased dramatically in recent years. However, the pace at which new technologies and needs are introduced and old technologies become obsolete has increased dramatically (Boisot, 1998). This rapid pace of change in the factors of production places a premium on the ability of individuals within an organization to track change and respond to it. This ability is one of the key features of successful KM.

Unfortunately, this is an area in which traditional information management systems (such as SASIxp™ or ABACUSxp™ from NCS or eScholar from IBM and Vision Associates) are particularly weak in general.¹⁰ Data warehouse systems are excellent tools for making complex selections of data from many different sources. However, there are no good inferential or predictive models in place within commercial school decision support systems for modeling school or student behavior in real time. This is not because there is not a rich understanding of student achievement. Rather, the cost and complexity of real-time KM systems represent a major obstacle to schools or districts taking advantage of this technology. Schools have lagged behind industry in replacing paper-based clerical and business functions (often referred to as back office functions) with technology-based systems. They often lack the physical infrastructure necessary for communication between numerous geographically dispersed buildings.

Increasing Access to Computing Power

The rise of *ubiquitous computing*, which places relatively inexpensive devices for information storage and manipulation on every desk, has made the conversion to technology-based systems possible. This trend is now finding its way into schools as they move away from using computers for rote learning to employ them as information tools. This is not simply a centralization-decentralization issue—i.e., the spread of technology from the district to the school and classroom. These resources can serve additional goals outside of instruction. A personal computer is both an information-gathering and an information-manipulation tool. The availability of computing at all levels of the educational system can be a focal point of change.

There are certainly budget, security, and management implications in broadening access to sophisticated computing technologies. However, the need for information transcends district governance issues. Moves toward greater local autonomy and responsibility—whether in response to school vouchers, charter initiatives, or other pressures—mean that there will be an increasing need for local analytical capacity. The need for well-informed local decision-making at the classroom level is not unique to any particular organizational form, however, such as block scheduling, or multi-age classrooms. It exists in both flat and hierarchical organizations.

The level at which decisions are made may differ across organization types, but there must still be robust data-collection and knowledge-dissemination mechanisms at all levels. This is particularly important given the different uses of individual data elements at different levels of aggregation and at different levels of the organization. Even at the school level, one can demonstrate the utility of comparing groups such as students who are bussed versus not bussed, or students participating in a specific after-school program versus students who do not. Traditional aggregations of data in such instances prove inadequate.

Student Data as the Basic Unit of Analysis

The problems outlined above suggest several possible avenues of system design that would lead to more appropriate data structures and produce more useful knowledge in an education knowledge management setting. The focus on student learning, and the persistent gaps in student achievement described above, should suggest to system designers that knowledge management systems should be student focused. What this means is that individual student data must comprise the basic building block of any knowledge management system in education. This includes data about the students themselves (test scores, demographics, attendance, etc.), as well as data about *treatments* or interventions intended to influence student outcomes. So, for example, professional development efforts aimed at improving the teaching of reading comprehension would need to be tracked, since these should have an impact on student learning. This implies that the school or instructor should collect the data locally and that the data should be used locally to inform teaching and targeted intervention programs. This is an important point that is often overlooked. The most basic common unit of analysis (sometimes referred to as an *atomistic* unit) should drive data-collection efforts and processes. If the student is the smallest analytical entity that will be studied, then attributes of that entity should be collected. In schools, this means that data should be gathered at the source. If schools and classrooms are where learning is produced, then local teachers and administrators need to collect and understand the data that will be used to measure that learning.

At the same time, however, districts need to integrate increasing demands for accountability, both fiscal and educational. Increasing scrutiny at the district level implies an entirely different focus for information system design. In this district accountability model, data are aggregated up to higher levels, such as the school or program, and are used to justify administrative or managerial decisions that affect large numbers of students and schools. This does not

simply mean a reliance on central capacity. Knowledge management should be responsive to needs at all levels of the system. The problem is that the events and outcomes being monitored all tend to occur at the lowest levels of aggregation—the student.

Even in the most centralized system, instructional outcomes occur at the individual level. However, most district accountability measures and goals are aggregated to higher levels of the organization. Data on student and teacher absence, student program participation, teacher professional development activities and test scores need to be available at the lowest level for aggregation to any meaningful unit—classroom, grade, neighborhood, or other coherent grouping. This means that only individual-level data will serve. This is important because reform efforts must work on multiple levels. It is also vital that the system be transparent in order to combat efforts to cheat or otherwise tamper with the data. Data collected at the student or classroom level need to be aggregated and fed upwards to higher levels of the educational accountability structure to inform system decisions made at those levels. A system without proper security in place could be subject to manipulation by school-level actors. Again, this is not an argument for or against centralization, *per se*. Rather, one must recognize that there are knowledge management decisions that are appropriate and possible at each level of an organization. Data structures and analytical tools should reflect this reality.

This divergence between existing data systems and data needs points to a gap between new technological capabilities and the policy environment that would enable schools to actively collect relevant information and put it to use in a KM system. When the model of change targets student learning, it is essential to focus on identifying those innovations (technical and organizational) that best serve schools and classroom teachers. Most existing models of school governance do not provide for data analysis at the classroom level. Often there is also a gap between technical capacity and technical feasibility. Most educational systems have very little technical capacity. For example, teachers may not have easy access to the Internet, or district computer staff may not have much experience supporting the analysis of problems relevant at the classroom level. There must be collection and delivery systems in place. There must also be analytical support for complex problems that are not solved by looking at simple bivariate comparisons. What technological capacity does a school system need? That depends on the system's goals.

Making instructional decisions in an individual classroom requires a sophisticated understanding of student attributes and of what individual curricular units can provide. The ability to generalize to a larger population is not a relevant concern in this context. At the school level, however, a principal may be very interested in how a new professional development activity is affecting student performance relative to other classes in the same building, or in comparison to other schools across the district that did or did not participate in the same training. The tools and data needed for within-classroom analysis are quite different from those necessary for a cross-school comparison. Differing forms of organizational analysis call for diverse forms of KM system implementation. One faces similar challenges at any level of aggregation, from the classroom through the district level to the federal level.

This discussion does not directly address the existence or quality of data needed for analysis. The lack of reliable data for school and student evaluation continues to be a vexing problem. Without a solid analytical model and the appropriate KM infrastructure to collect and aggregate the data, no district of any size would be able to implement a robust evaluation system. For example, many districts embrace an assessment policy that focuses on individual grade cohorts. This has led to the construction of information systems and testing plans that do not support longitudinal analysis of individual students. However, a system that allowed for accurate and fair evaluation at all levels of the educational system would differ radically from the current model that separates data use and evaluation (occurring at the state and district level) from the people who actually do the teaching and learning (schools, teachers, and students). A fair, consistent knowledge management system would provide an environment for implementing an *appropriate* stakes model at each level, rather than focusing *high-stakes* measures on teachers and children.

Variations in Organizational Approaches to Knowledge Management

Differing organizational approaches to knowledge management are one of the most broadly discussed areas in the field. Much of the recent literature that seems to be relevant for KM is based on the study of complex commercial organizations—primarily large, multinational, financial, and high technology firms—and comes out of the major business schools in the United States and Europe. These studies of KM point to a number of issues that educational technologists must address in the design of school district information networks before we can make significant progress in areas that range from measuring individual student performance to the most demanding evaluations of large districts and state-level educational systems. The contributions of research on knowledge management to school and district can be applied most directly to strategic planning efforts. The work of Marchand (1999), Feeny and Feeny (1999), the Schools Interoperability Framework (see Footnote 13), and the National Center for Education Statistics all provide assistance in applying KM principles to planning and evaluation.

Donald Marchand argues that organizational reform efforts can often best be described by the way in which they

operationalize their KM strategies. He describes four important dimensions of such strategies, as shown in Figure 1 (Marchand, 1999). On the horizontal axis, managing costs and risks are straightforward concepts. On the vertical axis, adding value implies increasing ones return on investment. New realities can be conceived of as both creating new services or goods and creating relationships with new customers. Points near the center of Figure 1 represent little or no activity along an axis, while points farthest from the center represent best practice.

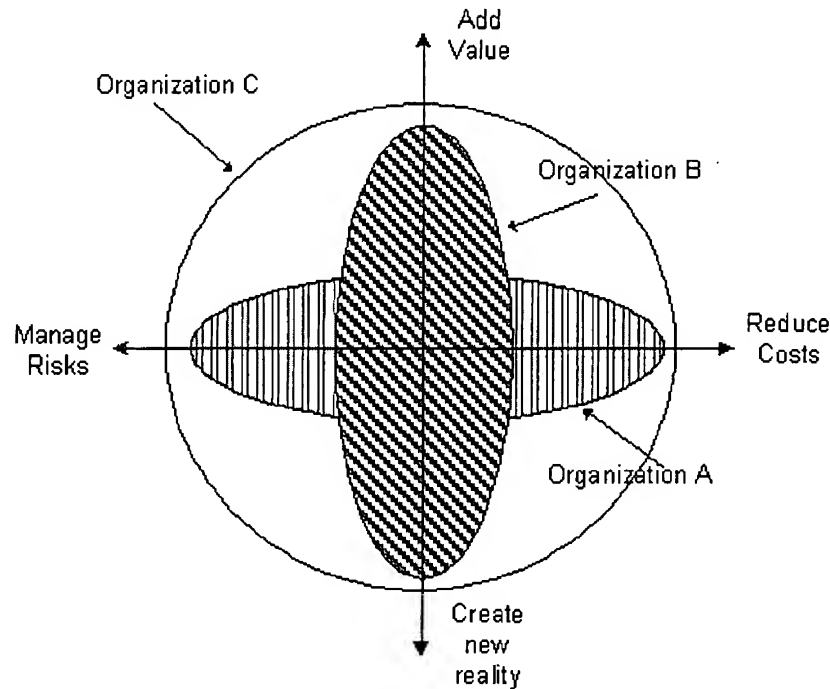


Figure 1. How Information Creates Business Value (Marchand, 1999).

In this example, Organization A is an organization that sees innovation in information technology as a way to reduce risks and costs. A school district following this strategy might implement a new in-school, computer-adaptive mathematics assessment to reduce outside testing costs and to help minimize instructional time lost to testing. Such a system might also help address the problem of mobile students who may not be included in once-a-year standard assessments. Such an assessment would be an element of a comprehensive program to reduce the risk of litigation associated with differential outcomes between poor and non-poor students by providing the opportunity to test adaptively and at smaller time intervals.

Organization B, on the other hand, perceives the value of improvements in information management as coming from adding value or enhancing existing interactions and creating new information services and products. A school following this strategy might invest in workgroup computers and a high-speed Internet connection. This technology would be used to support teaching a chemistry class in a virtual, web-based environment that would allow for the interaction of commercial and university subject-area experts as outside advisors and mentors for student projects.

Marchand argues that an effective organization with a well-designed information management plan will have a clear understanding of its place on these dimensions and will plan for its development needs accordingly. It seems clear that an organization with a mature understanding of the importance of information for decision-making might map its strategy onto Marchand's graphic as a circular structure, Organization C. However, the costs involved in moving a complex organization along multiple axes simultaneously would almost certainly be prohibitive. It is important to recognize the tradeoffs between adding to and protecting what already exists. A balanced strategy would reflect this.

Mapping one's own organization on this framework can provide some important insights. No single effort can conceivably score high in all four dimensions, but a comprehensive knowledge management strategy ensures that, as a whole, investment in appropriate technological innovation addresses all of an organization's major goals.

Marchand discusses another dimension not explicitly captured in this graphic. Is a particular knowledge investment

required for operation, is it essential for competition, or is it likely to bring distinction as a unique actor in the relevant market? Most investment in operational data systems tends to be directed toward the first two areas, day-to-day function and competition. It is the concept of standing out from the crowd that helps to drive truly innovative transformations of KM systems. In his research, Marchand finds that managers "rarely say that significant portions of their investments are focused on applications that give them distinctive competencies with customers" (Marchand, 1999). The immediacy and relative clarity of an organization's current operational needs tend to drive most KM investment strategies. This is no less true for school districts. Any district will have a working payroll or bookkeeping system. There is no other alternative. These systems must be operational and deliver substantial value. Investments in long-term payoffs, such as those often encountered in improving educational systems, typically suffer by comparison. A system for tracking curriculum development and delivery is typically not characterized by a sense of urgency. The rationale for building such a system is less clear-cut than for the other, more traditional, operational data systems. Operational systems track and manage day-to-day transactions but are of little use for planning or evaluation purposes. However, as is the case with basic research in the manufacturing sectors, there needs to be substantial investment in a knowledge management infrastructure for any organization to reap long-term payoffs. The return on investment from knowledge is small in the short term but can have a huge impact in the long run.

If one applies Marchand's dimensional framework to schools and asks how information creates value in an educational setting, the level of analysis becomes extremely important. For example, one focus of a school district, because it performs the business functions of any large organization system, would be on managing risks and reducing costs. District administrators would also be interested in producing increased learning, but they could only have an impact through indirect effects. One model of district action would be an active structuring of incentives and resources to create an environment in schools and classrooms that enhances learning. Bureaucratic structures are good at routine tasks and can provide infrastructure at a reasonable cost by taking advantage of economies of scale. Individual teachers, on the other hand, are engaged in directly adding value to the educational process and creating new realities for their students. This is a case of functional specialization. The problem is that actors at each of the levels need to be cognizant of the knowledge and system dynamics that define the other levels.

Even within a district office, there will be differences across organizational boundaries. Curriculum support staff might be heavily focused on "creating new realities" by aligning district curricular resources with new standards or goals. This might include a "training on demand" streamed video system for delivering professional development when and where it suits individual teachers and coordinators. Using technology to overcome the boundaries of time and space can create many new opportunities. A legal services team might be focused on reducing risk: for example, a district might put all Individualized Educational Plans (IEPs) online with a system for tracking interventions and student performance. This might be one response to concerns that special education students are receiving uneven access to services. This system could provide both a tool for demonstrating compliance and encouraging school staff to stay on top of student needs by making school-level activities more transparent. This drastic over-simplification highlights the difficulties one encounters when trying to design a system that meets the needs of actors at multiple levels in the educational setting.

It should be made clear that it is not necessary to build one monolithic knowledge management system. Indeed, it would be extremely difficult to build a complex system that would be adaptable enough to respond consistently to a changing educational policy environment. A resource that has been developed in this regard is the Schools Interoperability Framework, which is an important acknowledgement of the heterogeneity of data-acquisition and knowledge-management systems in use today.¹¹ Any realistic district information system must be made up of a matrix of interlocking systems that serve different functions and different user communities.

Risk versus Investments in Information Technologies

School districts are not unique in their spotty reliance on information technologies designed to enable and monitor reform efforts. Many district-level systems were created to comply with externally imposed reporting requirements. Unfortunately, investment in *transformative* types of information technology—technologies that will impact the underlying organizational goals and drastically expand capabilities—is inherently risky. In a recent study of large information technology projects, David and Leslie Willcocks Feeny found that over 70 percent of these projects went over budget and missed their completion deadlines. They note that

... the risks are even greater when, as with many Internet applications, real business innovations are also being looked for. The main reasons for disappointment cited also remain stubbornly familiar: incomplete definition of business requirements, insufficiently detailed technical specifications, changing business requirements, and lack of business user input during development. (Feeny & Feeny, 1999)

Innovation in knowledge management is difficult in a complex organization. In education, we have long experience with the problem of differentiating direct and secondary effects. The expectation is that improvements in the

educational setting—investments in class size reduction, teacher training, access to computers, etc.—will translate into improved learning on the part of the students. Schools and districts often engage in professional development efforts with the intent of improving student performance—an indirect effect of improving instruction. However, studies of the effectiveness of such efforts are often hampered by the difficulty of isolating and measuring the value added by a particular professional development program to performance at the individual student level (Kennedy, 1999). Expectations that simple technology initiatives will adequately address such complex problems are wildly optimistic, at best.

Unrealistic expectations are as likely to be attached to smaller-scale applications of technology as they are to large technology systems. One smaller-scale technological "fix" that is frequently advocated is the availability of computers in classrooms. Proponents argue that computers are valuable tools and resources for both teachers and districts. However, what frequently goes unrecognized is that, in order to live up to the expectations and serve the needs of both teachers and district administrators, computers must become an integral part of the classroom environment. Technology used as just one more *add-on* activity will have very little educational impact other than perhaps increasing keyboarding skills. There must also be sufficient computing resources in the classroom with links to district-level data systems that allow individual teachers to make meaningful queries in real time. If one believes that frequent measurement is critical for gauging the value added by a particular educational strategy, the ability to record and evaluate data in real time is crucial. District or state level analysis, on the other hand, would be a centralized, top-down approach that would have little use for complex data structures and would only rely on school-level technology for acquiring data. This distinction in interest between consumers of data at the different organizational levels also reflects the need for a more global understanding of the importance of the timeliness of data collection and rapid turn-around for results that are to aid decision making at the classroom level. The tension between district and classroom needs remains a troublesome barrier with respect to both turn-around time and the expected payoff for the time invested. Districts need data that are not immediately useful in the classroom (but must be collected there) and classroom teachers routinely assess their students and vary their interventions based on those assessments.

Finally, there is a serious question about the validity of the measures of student learning used at both the school and district level. Teachers often question the alignment of standardized tests with enacted curricula. There are also concerns about the consequential validity of using such tests to make high-stakes decisions about the progress of students and the retention or pay of teachers. By the same token, while a classroom assessment may be valid within that classroom, the reliability of such measures is too low to be useful for comparing student progress within a school or across a district. This is a problem that technological innovations can address, but not in purely technical terms. The design of new assessment instruments may be enabled by new delivery and recording technologies. The rapid growth of computer-adaptive testing and its immediate scoring and reporting of results represent an enormous change from the typical "fill in the bubble" examinations. Wide access to digital video has made the production of multimedia portfolios of student work a reality in many non-affluent schools. This is an area where the landscape is changing rapidly. As distance technologies improve to allow teachers to collaborate with subject-area experts, master teachers, test constructors, and others, it will become easier to work together on test quality and comparability. The social organization of classroom support structures will need to change as well, but the hope for coordination at a higher conceptual level can be realized.

III. Expected Benefits from Technological Innovations

There has been a great deal written about new forms of technical infrastructure and about the role that enabling technologies play in knowledge management. Schools often have very little in the way of technological infrastructure on site. However, the current thinking about successful knowledge management warns against relying on technology to solve the whole data management problem.¹² Dorothy Leonard-Barton (1995) suggests that the importance of "core technological capabilities" is a myth developed by managers looking for stability in rapidly changing environments. Instead, she provides a list of *non-technological* characteristics of what she refers to as renewing (or successful) organizations, summarized as:

- Enthusiasm for knowledge: Knowledge seeking and accumulation are encouraged and rewarded. A spirit of inquiry drives people. Curiosity is seen as an important asset.
- Staying ahead in knowledge: Having the drive to continue to learn and expand capabilities. Anticipating customer needs is the focus—not responding to them.
- Tight coupling of complementary skill sets: Tear down internal boundaries and operate in teams. There need to be boundary spanners in each area to make these external connections—don't make everyone a generalist.
- Iteration in activities: you never achieve perfection. Iterative improvements are the only constant. Developing core capabilities is more like gardening than building something—things need constant care and need to be

turned under and replanted from time to time.

- Higher order learning: Don't just learn from operational needs. Listening too hard to current customers (problems, etc.) can blind one to the needs of potential customers in new markets. "For every activity," the manager asks, "what is the potential knowledge-building import of this action? Is it part of a larger pattern to which I should be devoting attention? If not, should it be? If it should not be, why am I doing it?"
- Leaders who listen and learn: Leaders at all levels need to be knowledgeable about the organization's technologies. Eager learners are the most effective managers. (Leonard-Barton, 1995, pp. 261-266)

The model of information networks explored by Leonard-Barton has implications for many types of organizational culture. The points outlined above are entirely familiar to educators: Communities of learners can be described in this way. It is not surprising that the characteristics of successful teachers and teaching are similar to those necessary for success in other areas of professional interaction. However, it is essential that the importance of the level-of-analysis problem in this area be recognized as well. Information networks that link the different levels of educational innovation will encounter greater challenges to building interest and enthusiasm for knowledge if that knowledge is of little use at a particular level in the organization—especially if it is the level that must shoulder the greatest burden for data collection (i.e., the classroom). Likewise, there are difficulties in agreeing on data structures and analytical models when purposes differ. Questions focused on the performance of a particular third-grade reading program across a range of cohorts passing through that grade will engender datasets that are quite different from those created to answer questions about the long-term impact of that same program on a single cohort of students as they advance into higher grades. The data structures, analytical frameworks, and technological infrastructure necessary to answer questions in one area or level may have little relevance in another area or level.

Leonard-Barton discussed the importance of organizational culture for supporting knowledge management activities. It is also important to consider the involvement of critical users in the creations of a KM system. David and Leslie Willcocks Feeny (Feeny & Feeny, 1999) approach the imperatives for successful implementation of information technology-based innovation from a different direction. They argue that *users* of a technology must be the focus of any development or change effort, not its target. For example, a centralized reporting system for student attendance might provide detailed output that is designed by a district staffer to satisfy a state reporting requirement. Local schools, however, might have multiple additional needs that are not served by such a report. This is often the case when technology is developed by a central bureaucracy to serve its own KM needs. A KM system for student assessment will look very different if a district office designs it for its own use from the way it would look if it had been designed by groups of classroom teachers to support instruction.

The Feenys also point out that needs and requirements are not static in a rapidly changing complex system. Traditional approaches to system development are too linear to adequately address the dynamic, multidimensional nature of successful knowledge management systems. Another important characteristic of successful KM projects is the presence of high-level non-information technology supporters (e.g., managers not in the technology or computer departments). Since the adoption of KM technology is largely a social process, it is vital that senior operational managers support the project and show that they value active participation. These caveats seem to be particularly important for projects that attempt to integrate the needs of multiple levels within an organization. High-level support that focuses on an overriding need—such as improving student test scores—can be very effective in overcoming traditional barriers to cooperation that are often encountered in bureaucratic organizations. Needs that can be defined more broadly—that appeal to organization-wide norms or goals—are best articulated from upper levels of management and have the best chance of being widely accepted if they are sponsored by someone with no parochial interest in one system or another.

Others have addressed the problem of integrating human and technical systems. Karl Eric Sveiby has referred to information technology as the primary *hygiene factor* in KM: "IT is for KM like a bathroom is for a house buyer . . . essential because without it the house is not even considered by buyers. But the bathroom is generally not the vital differentiating factor for the buyer" (O'Dell, Grayson, & Essaiades, 1998). Technology is important for efficient transfer of vital knowledge, but delivers its benefits only as it supports human communication and knowledge construction.

O'Dell and her colleagues also provide important insights about some general rules-of-thumb for KM systems. They argue that "the more valuable the knowledge, the less sophisticated the technology that supports it" (O'Dell et al., 1998). For example, large data warehouses and data mining tools typically yield low-value knowledge, while a low-tech help desk delivers high-value knowledge. This is the difference between looking at pages of tabular data on the one hand and statistical analysis and advice from an expert on the other. The expert brings personal experience, context sensitivity, and technical skill and combines it with the data at hand to produce integrated knowledge as an output. The important point of this example is that the expert interprets information—data that has been systematized.

It is the aggregation of information and expertise that produces knowledge.

O'Dell, Grayson, and Essaides also suggest that the low-tech/high-tech split reflects the fact that "tacit knowledge is best shared through people; explicit knowledge can be shared through machines. Or, the more tacit the knowledge, the less high-tech the solution" (O'Dell et al., 1998). District-level information systems often contain a great deal of explicit knowledge about students and schools. Tacit knowledge is that uncodified knowledge that is based on personal experience, absorption of organizational norms, and other factors. Explicit knowledge is information that has been written down or recorded in an information system. This might seem like a simplistic distinction, but it has important implications for decision-making and the reform process. This does not mean that the accumulation and transmission of tacit knowledge is not possible. Rather, it means that knowledge management systems must have imbedded in them some portion of the critical tacit knowledge needed to interpret information in the system at hand.

For instructional decisions, teachers and school-level administrators, for example, often operate on the basis of tacit knowledge about an individual student or group of students. These data are much more difficult to aggregate and transfer. The primary problem is not technical. Rather, it is the difficulty of developing relevant metrics for a wealth of anecdotal data. Another important example of the importance of tacit knowledge is the practice of using individuals as the focal point of reform efforts. School districts often use successful principals and other administrators as agents of change. Administrators that have been able to "turn a school around" are seen as a valuable commodity. The literature on KM refers to this process as one of using mobile intellectual capital to bring expert skill to bear on a particular local problem (Albert & Bradley, 1997). The value of intellectual capital is often the tacit knowledge about how one manages curricular changes or fosters a positive school climate. This process of conveying tacit knowledge about such a complex task is one example of a knowledge system.

The drawback is that tacit data is not easily transferred and successes at one location are not easily replicable to another. Some KM system-designers attempt to imbed the interpretation of experts in the outputs of the system; for example, one might present a bar graph of mean scores on a particular set of assessments. A more knowledge-rich presentation might include a representation of error bands around the mean, or provide a comparison to scores of the same students in a prior assessment. It is not merely that the information presented should be contextualized. It is important that the contextualization be done in a way that makes a valid comparison and enhances the explanatory power of the measure in question.

As the Feenys, Davenport, and others suggest, there are distinctions along the continuum from data to knowledge. What these authors do not provide is a detailed understanding of how one applies this continuum to an educational setting. In order to bring about the senior management participation that Feeny refers to above, it is necessary to establish the payoff of the investment in knowledge management at every level of analysis. If the unit of analysis is the student, then the other questions are derived from that. The analytical framework should focus on the individual. The data structures in this case must be available at the individual level and be sufficiently broad for meaningful diagnostic use. Making the linkages clear between different levels of the organization and building methods of capturing and using tacit knowledge are two characteristics that must remain in the forefront of any design effort.

Efforts to Reform School Data-Management Practices

Much of the work that went into this paper was informed by nearly eight years of experience working with education assessment and program data from the Milwaukee Public Schools (MPS). It has become increasingly clear that the ability of complex educational agencies to perform timely, in-depth, and accurate analysis is severely hampered by data-access problems. Indeed, there are increasing concerns that the district does not have the data it needs to make many important decisions or, if the data exists, they resides in a computer system that is difficult to use. In our work with MPS, we hope to take advantage of two major ongoing efforts. The first is the Schools Interoperability Framework (SIF). The SIF "is an industry initiative to develop an open specification for ensuring that K-12 instructional and administrative software applications work together more effectively."¹³ The initial area of collaboration will be in the area of intra-application communication. The model the SIF group is supporting is an *open-system environment*. This approach recognizes that schools and districts will continue to use a mix of information technologies from various vendors. The SIF initiative is focused on setting data exchange standards that will let the major school management and instructional support packages talk to each other without human mediation. This will help to decrease the transaction costs of systems with broader functionality and should allow for better aggregation of data across schools, districts, and states.

The founders of the SIF emphasize the need for comprehensive, consistent data management from a market-driven point of view. They argue that it is impossible to provide sophisticated applications if each individual school district pursues its own data-management strategy.¹⁴ The challenge the SIF has set for itself is based on the efforts of the business information technology community to move from data-management to knowledge-management systems. While the issues involved in successful knowledge management are largely absent in the literature on educational

administration and assessment, an important and growing body of work is emerging from business schools around the world. These works range from thinking about the role of experts in organizational learning (Albert & Bradley, 1997) to multi-dimensional representations of the lifecycle of knowledge (Boisot, 1998). The *Financial Times* recently ran a three-month series reviewing the current thinking in academia about knowledge-management systems.¹⁵ This series does an excellent job of making very complex models of organizational development and impact assessment accessible to a broad audience and has helped to inform our discussions with decision makers in Milwaukee.

The second important strand of work comes from the National Center for Education Statistics (NCES, 2000).¹⁶ This effort produced a comprehensive, standards-based model for school data system definitions. Unlike a product created by a particular vendor, district-level, state-level, and federal education administrators developed this model. Rather than being market-driven, the NCES Forum on Educational Statistics focused on the decision-making needs of school- and district-level administrators. This focus on users of data turns the traditional approach on its head. Most major school software systems—such as the offerings for National Computer Systems (NCS)—are driven by a lowest-common-denominator approach, where the package provides for the minimum needs for the maximum number of possible users. The NCES data elements, on the other hand, are developed to a high level of specificity and are intended to be extremely flexible and encompass the widest possible use.

Both of these efforts point toward the importance of standardized acquisition and the use of data for day-to-day and long-range decision making. The issue of standardization is particularly important when the focus is on evaluation. Increasing demands by outside funders and state and local agencies for data on program impact continue to raise the analytical burden placed on the district. In traditional transactional student data systems, the focus is on managing schedules and tracking attendance and grades. Reporting is designed using a top-down approach that is focused on district, state, and federal reporting requirements. What the NCES proposes is a much more flexible design that would support very fine-grained inquiry from any level of the organization.

IV. An Example of Mismatched Rationalities: The MPS Case Study

Some of the problems one faces in a complex education institution can be seen in the following brief case study. The study describes how different organizational levels of a large metropolitan school district responded to the approaching deadline of a high-stakes assessment for its students at the end of eighth grade in the spring of 2000. The situational rationality of each major player led to radically different approaches and outcomes as the district struggled to develop an information system that would track students on their progress towards proficiency and that would accurately report student outcomes for retention and promotion decisions.

The District's Technology Strategic Plan

The practical implications of a robust systemic analysis framework are daunting. District officials were not unaware of this problem. In its *Technology Strategic Plan*,¹⁷ the planning committee outlined specific data needs for teachers and school administrators that are a direct result of district decentralization. The following excerpt from the report's Executive Summary outlines the technology needs of the three levels of the organization:

Classroom Management in a Decentralized Organization

Instructional time can be increased by reducing teacher time spent on classroom management tasks like attendance and grade record keeping. A single point of data entry (the teacher) should distribute that information across the school. New technology can then make available that data and integrate all other data relevant to a particular student to assist staff with decision making and the provision of services.

MPS has taken steps toward redesigning the student information database maintained at the district level. In addition, a site-based transaction-oriented database system is required. The two databases together can exchange relevant student information to provide better support.

School Management in a Decentralized Organization

Decentralization has imposed staggering new responsibilities on school management personnel at the same time that the complexity of client needs has increased. School-based technology will help address these challenges.

MPS Accountability in a Decentralized Organization

Systemic integration of reporting data at both the school and district level is required to tie together school educational plans, school accountability measure reports, district monitoring reports (MPS report card), state reports, and federal reports.¹⁸

This portion of the strategic plan was then used to develop a Request for Proposal (RFP) for a new School Management System to enhance and extend the existing information system's capabilities. The two major themes of the *Technology Strategic Plan* and the RFP were "providing data to drive local and district decision-making" and assuring that the system "support school innovation by providing a tool that allows schools to implement their own initiatives and educational models."¹⁹ These two goals imply an information system that is both a decision-support system that is linked to district and local goals, as well as one that has the capacity to deliver new data acquisition and reporting capabilities linked to local needs. Either of these goals by itself would have been difficult to achieve. Achieving them simultaneously would take both innovative programming and high-level training for the intended users in the schools.

The RFP laid out global system requirements that addressed some of the major shortcomings of the existing system. These requirements included an integrated security model, an import-export facility, and a user-friendly query-and-reporting capability. These prerequisites are important features that the legacy system lacks. The document goes on to elaborate on the current situation (at that time) and projected needs in all of the major data subsystems. The distance between the existing capabilities of the system and the projected end points were sometimes quite significant. One of the most positive elements of the RFP was the theme of data-based and data-driven decision making.

One of the major considerations to be faced in designing a database is to understand the questions that will be asked of the data. Much of the RFP is focused on improving the timely collection and reporting of student data: attendance, guidance interventions, discipline, and grades. It is also clear that data collected by the new School Management System (SMS) will be used to evaluate individuals, programs, and processes. The SMS system was purchased from a systems integrator and is being adapted to the needs of the district. The needs of the district require universal access—the ability to access a particular set of records from any location—and real-time longitudinal elements that track changes as they occur over time.

The shift from a centralized data storage and reporting system to a responsive, pervasive decision-supported system is a difficult challenge. The client/server topology recommended in the *Technology Strategic Plan* and required in the RFP provides a division between processing power and data accessibility that reflects the needs of actors at different levels in the system. The proposed system incorporates the two primary models of client/server system design. First, individual school administrators and teachers will be able to query the central data repository from their own computers. Second, the data queried can be downloaded to a local computer for further manipulation, or for combining with local data. The central data store might also supply "what if" datasets that allow for the development of contingency planning based on changes in important systemic variables.²⁰ Most importantly, the system being developed will allow people at a distance from the central office to become sophisticated consumers of student and system process data.

The Case of 8th Grade High Stakes

The decision to impose promotion requirements on 8th graders was made in 1997 as part of a larger change in the district's accountability model. The district was simultaneously engaged in a major effort to develop and implement proficiency testing in middle school both to encourage good teaching practices and to provide a broader range of assessments (in addition to standardized tests) to better understand and represent student learning. The district was also in the development phase of a district-wide technology strategic plan—begun in 1996—that had as a central component replacing older transactional systems for the day-to-day management of student records and building a data warehouse that would support site-based decision-making.

One of the important responses to the introduction of a multi-method assessment was the formation of the Middle School Principals Collaborative. The principals from 12 of the 23 middle schools initially formed this group. The group has since grown to include all middle school principals. One of the central duties of this group (in cooperation with district administrators) has been to work out the details of designing, implementing, and evaluating the proficiency standards and assessment structure of the district's middle schools. Over the course of the following two years, as the group grew to include all schools, the district and participating schools began to negotiate what metrics were to be recorded to demonstrate student proficiency. While several different methods were discussed, they all revolved around weighted averages of multiple measures.

At the district level, the units responsible for implementing the recently developed Technology Strategic Plan were building a number of new applications. Two of these efforts were of particular interest for school administration. The first is called the Student Management System (SMS). The SMS was to be a new transactional system for managing

student information. This would include enrollment, attendance, grades, discipline, program participation, and other elements. SMS was intended to replace a mainframe-based system—portions of which were over 15 years old. The other important school information system to be developed was a data warehouse for student assessment and other outcome data. This system was intended to provide an analytical resource for studying programs, assessing school effectiveness, and generating reports for external accountability.

The intention was to make the SMS and the Data Warehouse available at all levels in the district. The distribution of the SMS from the district down to the classroom level was designed to accomplish a number of things. First, data entry was spread across a wider set of district personnel. Teachers would be able to take attendance in their classrooms and record assessment data directly. The teachers would also be able to check on student program status themselves. The system further allows teachers to record lesson plans and other data to capture more fine-grained data about classroom practices. Planners hoped to be able to integrate much of this data into the Data Warehouse for later analysis at higher levels of aggregation. This would make it possible to develop a better understanding of such factors as the impact of new curricula and changes in professional development.

The Data Warehouse was intended to provide local access to assessment and program participation data extracted from SMS and combined with test data from external vendors, referral data from special populations support systems, and other standalone data systems. System designers proposed developing different methods of interacting with the Data Warehouse that would support both differing data-use needs and differing technical skill levels of the system's users.

During this same period, we were working with staff members of the Office of Research and Assessment to help them develop their support for databased decision making in schools. Since much of our work is focused on the district level, we felt that it was also important to examine best practices for local data collection and manipulation. To this end, we have been working with Derek Mitchell of CRESST²¹ and the Quality School Portfolio (QSP)²² to consider the critical elements of good, school-level, information-system design.

On April 26, 1999, we participated in a district-wide review of the status of the MPS Student Management System and Data Warehouse projects. At this meeting, we also presented the QSP tool as an avenue for forming additional insights into school-level student data decision making. MPS deputy superintendents, most department heads, and representatives from the University of Wisconsin-Milwaukee and Alverno College attended this meeting. The meeting covered the actual progress to date of the ongoing design efforts, as well as the pressing data needs of Milwaukee's middle schools. Representatives of the Middle School Principals Collaborative also presented their homegrown approach for tracking student progress. This initiative was developed as a direct response to the district's inability agree on a set of proficiency metrics and provide the specifications for a data management system to deliver the needed data in a timely manner. One important outcome of this meeting has been the growing sense of urgency regarding the delivery of useful analytical data for decision making at the school level.

The QSP presentation served to provide both a background for discussing the needs of site-based decision making and an overview of information-systems planning across the district. The major areas of thrust behind QSP (school action plans, reporting processes, data-based decisions, and accountability) are by no means unique to this software package and reflect the needs of site-based decision makers in any field. We discussed how QSP might be used to accelerate the development process of the Data Warehouse by providing a conduit through which site-based managers could funnel back their own analytical models. We discussed our interest in the research on how schools store, analyze, and retrieve data in support of continuous improvement and other school reform models.

There were three significant outcomes of this meeting. First, the director of the MPS Department of Technology Services committed his staff to doing their best to get all of the middle schools wired and hooked up to the SMS system by Fall 1999. He also committed the application development team to building and fielding a system for capturing and reporting the middle schools proficiency data that would be used to make promotion decisions for students who would be 8th graders in the 1999-2000 school year as soon as the specifications for this system could be finalized. The second outcome of the meeting was the decision of the Middle School Principals Collaborative to continue the development of its own school-based system in the event that the district would be unable to meet the Spring 2000 deadline. The leader of the effort expressed concern that given the other pressing technology initiatives in progress that it would be difficult for the district to build and deliver a system in such a short span of time would be difficult.

Finally, from our point of view, the most important outgrowth of this meeting was a decision by the then director of the Office of Research and Assessment for that office to build its own analytical database. This decision was driven by two different concerns. First, there was the recognition that a number of schools were under pressure to make decisions about preparing students for upcoming high-stakes assessments. Neither the existing mainframe system nor the new Data Warehouse being implemented has the capacity to provide the level of flexibility in reporting needed by

schools. Second, there has been a growing realization that meeting day-to-day, operational data needs and answering questions about accountability require different interface, data-storage, and data-manipulation technologies and do transactional or compliance-focused systems. In MPS, this gap between operational and research needs has led district research staff to face the necessity for developing a different data management architecture to support these separate efforts.

At this point, there were potentially three different systems that might be in place by the end of the 1999-2000 academic year to track and report on the promotion status of 8th grade students. What was unknown at the time was that the recently elected (April 1999) school board was about to replace the superintendent. One month later, a new superintendent was in office; he replaced almost all department heads (the director of Technology Services retained his position) and one of the two deputy superintendents. In addition, the director of the Office of Research and Assessment was moved on the organizational chart to report to the director of Educational Services rather than to one of the deputy superintendents. These changes at the district level both halted the plans for the creation of a separate research data system and challenged the leadership of the technology services by replacing many of the experienced decision makers so that neither group was able to accomplish its goals for supporting the 8th grade graduation decisions. By the end of September 1999, both units formally informed middle school principals that they would not be able to provide any direct help in collecting data on student progress towards meeting graduation requirements, nor would they be able to do anything more in reporting on student retention. All middle schools were going to be responsible for notifying high schools of the status of each student at risk of not passing by the end of the summer school session.

Despite the political and technical upheaval occurring at the district level, the Middle School Principals Collaborative was continuing to meet to discuss tracking student performance and reporting student progress towards promotion to teachers and administrators. The middle school principal who had developed his own system for tracking this information formally offered his system to the group and agreed to both modify the system to fit several different school organization models and to train a small number of people to provide training support in turn to their counterparts in other middle schools. This effort was designed to use existing hardware and software and would run on either Windows or Macintosh computer systems. It was also designed with the expectation that it could be combined on a central server and managed by either the Principals Collaborative or some unit at the district level. The system went through several formal reviews and revisions and was used at the end of the school year to produce electronic files that were sent to the district's Office of Research and Assessment for review. These files were then uploaded to the Data Warehouse for use this fall to generate statistics for the district's accountability report.

The most serious dilemmas encountered by participants in these development efforts were not technical. The district had not completed its connection of the middle schools to its high-speed network, but the amount of data that needed to be communicated was trivial. The barriers all revolved around communication. As the end of the school year approached in the spring of 2000, I was asked by the manager of application development in the Technology Services department to become a formal member of the Data Warehouse development team. The team is explicitly responsible for making sure the warehouse contains the data necessary to produce the district's annual accountability report.

My involvement was partially based on my knowledge of desktop hardware and software, but the primary reason the team leader wanted me to participate was to overcome the communication barriers between the Department of Technology Services and the Research and Assessment Office. I was also the only person on the committee who directly represented school-level interests through my involvement with the two middle schools I was helping train to use the QSP tool described above. It became clear half way through the first meeting that the group had not developed a common understanding of the needs of the schools or of the limits of existing data systems in meeting the district's accountability needs. I was also surprised to find that the Data Warehouse team did not include, nor had ever included, a school administrator.

The team worked over the next two months to put together a plan for collecting the school-level data and putting it online. We also identified an alternative method for collecting the results of the summer school assessments of students who had not passed by the end of the regular academic year. The mix of technologies included installing the standalone system developed by the Middle School Principals Collaborative in all schools with 8th graders and requiring them to use it, repurposing a dormant mainframe system to collect alternative assessment data on summer school students, writing custom programming to aggregate the school data and load it into the Warehouse, and creating a new report on a discontinued report card system to provide high schools with accurate placement data for students who were or who were not retained in grade at the end of summer school. While the process was successful in the end, the resources used to respond to this emergency reporting need could have been better spent in other areas if the district's data management system had been in synch with the accountability requirements the educational system had placed on schools and students.

Preliminary Conclusions

Knowledge management is such a wide-open area of study that it is difficult to understand the implications of these models of knowledge management for an educational setting. One thing seems certain. School information systems are one of the most difficult to harness because they often lack any overall rationality for cooperation and compliance. Differences in data needs and uses across different organizational levels present significant barriers to the collaboration necessary for innovation in knowledge management.

The case study cited above points to a number of different areas for concern. First, ambitious systemic reform efforts call for radical changes in traditional school information systems. The dimensions of knowledge management strategy that Marchand maps out in Figure 1 provide a background for the difficulties MPS managers encountered when they attempted to make a sweeping overhaul of their information technology infrastructure. Even the most conservative deployment estimates of system designers in the original Technology Strategic Plan are more than two years in the past. Developers estimate that it will take another two years to complete the wiring and programming necessary to bring all 160 regular schools online. Some managers have indicated that the declining political support for the system and the ongoing burden of customization will probably lead to the development of a new system independent of the externally purchased SMS application currently being implemented by Milwaukee high schools.

The Data Warehouse is also several years behind schedule. There remain two major stumbling blocks to the development and use of the system. The first hurdle is the difficulty of producing assessment, enrollment, and program participation statistics that match those created by the existing combination of mainframe exports, SAS (statistical software) scripting, and hand manipulation used to produce the district's accountability reports. This problem can be traced back to the inherent complexity of the analytical puzzle of tracking a highly mobile population of students with an archaic information system that relies on a great deal of expert knowledge on the part of its users. This is simply a high-dimensional analytical problem that cannot be easily moved from one system to another. The other problem is that the new data system uses different data element definitions, field layouts, and formats. The new system is designed to take into consideration the improvements in methodology and changes in how one defines important school metrics such as value-added assessment and program effectiveness. Any comparison of analytical models between the two methods of producing accountability statistics requires the ability to engage in a sophisticated translation among approaches that are vastly different.

The other stumbling block the Data Warehouse faces is the method of access that school administrators and teachers will use to extract data for local analysis. The tool that was initially adopted is being used by district-level analysts in the Department of Technology Services and the Office of Research and Assessment, but was seen as too complicated for the average or casual user. Other solutions that rely on Web-based access are either not supported by the some of the desktop technologies in place, do not meet the security requirements the district must meet to protect student data, or are as complex as the tool the district is currently using.

Finally, the lack of strategic planning and strategic resource allocation continues to plague development efforts at the district level. It is possible to raise funds to support the infrastructure in providing high-speed video to several thousand classrooms, but it is difficult to find the resources to train the staff to use video effectively, or to build an evaluation system to track the impact of this technology on teaching and learning. It is the mismatch between resources available for high-profile technologies and the resources available to measure effective teaching that lead to the dilemmas encountered by Milwaukee Public Schools. The level- and unit-of- analysis problems alluded to above only exacerbate this mismatch between resource availability and needs. When both resources and the external requirements for annual accountability focus development efforts on the introduction of newer and newer technologies, school-level needs are bound to be short changed.

Notes

¹ For an overview of the literature on standards-based reform see, for example, the National Council of Teachers of Mathematics standards website at <http://www.nctm.org/standards/introducing.htm> or Kirst and Bird (1997) at http://www.wcer.wisc.edu/nise/Publications/Research_Monographs/vol2.pdf

² This definition is adapted from an address given by Deputy Secretary Smith at the National Institute for Science Education 1999 Forum.

³ See, for example, the NSF Educational System Reform site at <http://www.chr.nsf.gov/esr/> or the Department of Education's National Research and Development Centers at <http://www.ed.gov/offices/OERI/ResCtr.html>.

⁴ For more on authentic assessment, see Neumann, Secada, & Wehlage (1995).

⁵ For some of the best examples of this literature see the Journal of Knowledge Management at <http://www.mcb.co.uk/jkm.htm> and resources links at the Financial Times *Mastering* series web site at <http://www.ftmastering.com/links.html>

⁶ http://mpscda.milwaukee.k12.wi.us/html_files/Purpose_cda.html

⁷ <http://www.cos.com/>

⁸ <http://www.eims.org/>

⁹ streifer@eorls.com

¹⁰ Information about NCS can be found at <http://k12.ncs.com/>. IBM's school and district management site can be found at http://ind.clearlake.ibm.com/industries/education/solution/SOLUTIONS_19443.html. For more information about eScholar go to <http://www.escholar.com/>.

¹¹ For a list of organizations involved in developing an interoperability framework between school and district information systems see, <http://www.schoolsinterop.org/spec/Acknowledgements.htm>

¹² Others have written more extensively on the computer-human interface. Two examples of this work are Rouse, 1991; Shneiderman, 1998).

¹³ The SIF site can be found at <http://www.schoolsinterop.org/spec/Acknowledgements.htm>

¹⁴ The SIF data exchange specification can be found at <http://www.sifinfo.org/spec.htm>

¹⁵ An overview of the entire series on information management can be found at <http://www.ft.com/mastering/>

¹⁶ These reports can both be found at the National Forum on Education Statistics site at <http://nces.ed.gov/forum/publications.html>

¹⁷ *Milwaukee Public Schools' Technology Strategic Plan*, December 11, 1996 (Rev. 02/01/97) <http://whscdp.whs.edu/tsp/plan/>

¹⁸ "The Impact of a Client/Server Architecture on Decision Support Systems," by M. Whitman and H. Carr, 1994, *The Executive's Journal*, 10, p. 8-9, 12.

¹⁹ MPS. *RFP-239*. p. 0-3.

²⁰ For more on this, see, for example, M. Whitman & H. Carr, *Information Strategy*, Winter 1994, Vol. 10 Issue 2, p. 12.

²¹ CRESST (The National Center for Research on Evaluation, Standards, and Student Testing) is located at UCLA. <http://www.cse.ucla.edu/>

²² More information on the QSP can be found at <http://qsp.cse.ucla.edu/>

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Education Policy Analysis Archives

Volume 9 Number 48

November 19, 2001

ISSN 1068-2341

A peer-reviewed scholarly journal

Editor: Gene V Glass

College of Education

Arizona State University

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Information Technology and the Goals of Standards-Based Instruction: Advances and Continuing Challenges

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Citation: Archbald, D.A. (2001, November 19). Information Technology and the Goals of Standards-Based Instruction: Advances and Continuing Challenges, *Education Policy Analysis Archives*, 9(48). Retrieved [date] from <http://epaa.asu.edu/epaa/v9n48/>.

Abstract

This article examines goals of standards-based reform in education and ways in which developments in information technology have facilitated those goals. Since standards-based reform is a rather general concept, I begin by developing a more specific formulation which I refer to as the "standards-based instruction and assessment" model. Developments in information technology over the last fifteen years have contributed in important ways to the goals of standards-based reform at the policy level, but difficult organizational and technical challenges still have to be overcome to realize more fully the goal of standards-based instruction and assessment in instructional management and practice within schools and classrooms.

Introduction

It is axiomatic that effective education requires *monitoring* students' academic progress and *using this information* to design appropriate instruction. Planning, instruction, and assessment should be closely interconnected and cyclical (Angelo, 1998; Linn & Gronlund, 1995; Otto, Wolf & Eldridge, 1984; Tanner, 2001). (Note 1) Standards-based instruction and assessment, as the word *standard* implies, means consistency in expectations for student achievement and curriculum coverage and consistency in the standards by which students are evaluated. This requires that standards be clear, specific, and uniform—not fluctuating depending upon which teacher a student gets, what week of the school year it is, or what grade, course, or school s/he happens to be in. Teaching toward clear and consistent standards, assessment of student performance to monitor progress, and utilizing assessment information for instructional planning—these are the elements of what I shall refer to as "standards-based instruction and assessment" (SBIA).

SBIA is an ideal—a set of principles to strive for. There are many obstacles to realizing the ideals of SBIA in schools, but progress has occurred both because of education reform initiatives and developments in information technology in education: namely state standards-based reform policies and web-based systems for reporting standards and assessment results. After elaborating more on SBIA, this paper explains and provides examples of how progress is occurring at the state, district, and school levels. At the same time, there is still far to go and obstacles to overcome before more fully realized versions of SBIA operate effectively at the classroom level. The last section of this paper examines some of these obstacles.

Ideally, teachers teach toward a clear set of instructional objectives. This statement does not imply a mechanistic pursuit of minutely specified behavioral objectives. While educators disagree on the specifics of good objectives-based instruction, there is virtually universal agreement with the principle that good teachers have a very clear understanding of the instructional outcomes they seek (Angelo, 1998; Smith & Ragan, 1999; Wiggins, 1998). They are clear on what they want their students to know and be able to do at the culmination of instruction. Good lessons and units have clear and specific academic aims. Effective instructional planning entails thoughtful design and sequencing of lessons and units.

Assessment is integral to effective instruction. Good teachers assess the outcomes of their instruction frequently by questioning students and with more formal assessments of student learning, and they use the assessment information in the design of subsequent instruction. On a moment to moment basis, in the context of instruction, good teachers use a variety of questioning techniques to assess student comprehension and developing proficiencies (Angelo, 1998; Tanner, 2001). Over the longer term, from lesson to lesson, unit to unit, and marking period to marking period, good teachers systematically collect and manage assessment data on their students. Good teachers also evaluate their impact on students over the course of the year, by examining individual and aggregate growth of their students based on appropriate local and norm-referenced and criterion-referenced assessments. Appropriate assessment data include scores on tests, quizzes, and other diagnostic and standardized assessments, as well as grades and other forms of student information useful for instruction. When assessments reveal students are not achieving desired learning outcomes, instruction is revised accordingly. Planning, instruction, and assessment should constitute an ongoing, integrated cycle.

Standards-based instruction and assessment requires that teachers teaching at the same grade, whether in different classrooms or schools, be guided by the same content and performance standards. As asserted earlier, this is an ideal, a set of principles to strive for. Ideally, expectations for student achievement and standards of curriculum content should not be dependent upon what classroom or school a student happens to be in. The planning and delivery of instruction should be guided by and aim toward clearly specified standards. Whether standards prescribe how well students should be able to read or write by certain grade levels, what topics they should cover in particular courses, or what competencies they should demonstrate at graduation, in principle the standard is the same for all students—that is what “standard” means. The antithesis of standards-based instruction is each teacher independently deciding what will be covered in his/her classroom and the level of achievement expected of the students. Without standards, expectations for student knowledge and achievement and instructional goals are necessarily based on the idiosyncratic preferences of individual teachers.

Fully realized at an *organizational* level, standards-based instruction and assessment (SBIA) requires that the planning, instruction, and assessment cycle be vertically integrated among the school’s different levels: student, classrooms, supra-classroom groups, whole school (McEwan, 1998; NEC, 1985; Otto, Wolf & Eldridge, 1984). Standards of achievement should be clearly understood and operate school-wide, with adequate data to monitor performance and processes at organizational and sub-organizational levels. The model assumes that teachers have a common vocabulary to plan instruction and reflect on practice; plan instruction from a shared understanding of content and achievement standards; evaluate students based on principles and expectations that are consistent across students, groups of students, and periods of time; and participate in instructional management, such as monitoring the effectiveness of instructional programs and identifying instructional and resource allocation priorities for short and long-term planning. Research shows that schools vary widely in their ability to achieve SBIA at an organizational level—with leadership being a critical variable—and that schools that are able to implement effectively principles of SBIA are likely to be better schools (Archbald & Newmann, 1992; Kaufmann, 1992; Levine & Lawrence, 1992; Leithwood & Aitken, 1995; McEwan, 1998; Sanders, 1999; Senge, 2000; Wohlstetter, Kirk, Robertson & Mohrman, 1997).

A Gap Between the Standards-based Instruction and Assessment Model and Practice

Planning, instruction, and assessment occur as a cycle to some degree in all classrooms and schools—but to what degree is this process standards-based, informed by assessment data, and integrated at the organizational level? That is, to what degree does it conform to the principles of SBIA?

The standards-based reform movement has occurred in large part because many people believe there has been, and perhaps continues to be, a significant gap between instruction in practice and the principles of SBIA. Building in the mid-80s and continuing throughout the 90s, the education standards movement resulted in widespread adoption in almost all states of written standards of content and performance and standards-based testing programs to measure student achievement and school performance. Before turning to some of the accomplishments of standards-based reform in education, let us examine some of the conditions that lead to it.

Certainly one of the most significant factors has been the glaring disparities in achievement and presumably academic standards among schools, especially between schools serving lower-income and/or minority populations and schools with more middle-income, non-minority populations. While these disparities have been fodder for numerous newspaper articles and government reports, one notable study with evidence of disparities in standards among schools was reported by the U.S. Department of Education’s Office for Educational Research and Improvement. This study (OERI, 1994) found students in low-income schools getting “mostly As” in reading and math, while students *matched on reading and mathematics ability* but enrolled in schools with low percentages of kids in poverty were getting

"mostly Cs." The obvious implication is that reading and mathematics ability levels sufficient to get high grades in lower-income schools, would likely produce only "Cs" in schools with more higher-income children.

Other studies have examined more directly variation in teacher expectations and instructional practices among schools and classrooms. A review of observational research on reading instruction found "substantial variation across teachers" on such variables as academic focus, classroom management problems, and time-on-task in reading, with predictable relationships with reading achievement (Rosenshine & Stevens, 1984: 782). Likewise, a national survey of reading practices found "considerable variation" among teachers in reported teaching philosophies, learning goals, and instructional practices (Baumann, Hoffman, Duffy-Hester & Ro, 2000). (Note 2) A study of a large sample of teacher-made tests and quizzes from middle school general mathematics courses found teachers' tests varying widely in their level of alignment with the standards published by the National Council of Teachers of Mathematics. Some teachers' tests were composed of more than two-thirds "single-step/single-solution" computation problems, while for other teachers the percentage was as low as one-third, with the majority of their test questions involving higher levels of mathematical reasoning and problem solving. Teachers varied even more in the extent to which test questions involved contextualized problems, mathematical representations, and written explanations of mathematical reasoning (Archbald & Grant, 2000). A similar study by Senk, Beckman and Thompson (1997) found that teachers ranged greatly in their reliance on multiple-choice formats for their tests from a low of 3% to a high of 42% of tests used in their courses. The percent of "low-level" items (answers can be computed in one or two steps) among tests ranged from 55%–90%. The data clearly suggest that teachers' views of what constitutes adequate achievement and their instructional and assessment practices vary widely.

As the above studies indicate, the particular teacher to which a student is assigned matters a lot. A growing body of research indicates that "differential teacher effectiveness is a strong determinant of differences in student learning, far outweighing the effects of differences in class size and heterogeneity" (Darling-Hammond, 2000). The teacher to which a student gets assigned to a large degree determines the content s/he will cover, the pedagogy s/he will experience, and the academic standards s/he will be held to. In the absence of clear and consistent standards and standards-based assessment within the school, it stands to reason that there is likely to be more idiosyncratic—"standards-free and data-free"—instructional planning and assessment, contributing to disparities in achievement expectations and the quality of instruction (Otto, Wolf & Eldridge, 1984; Valencia & Wixson, 2000). SBIA should be able to reduce the number of students held to substandard academic expectations, subjected to poorly planned and sequenced instruction, and socially promoted through the grades with inadequate skills and undiscovered learning deficiencies.

Another factor fostering support for standards-based education reform policies has been the perception of deficient instructional management at the school and district level, perceived in part to be a product of the absence of agreed-upon standards and measurement of results, and limited accountability for results. (Note 3) An example of deficient measurement systems is revealed in this anecdote from an administrator in a New York district. She describes the following attempt to use data to make an important decision related to the effectiveness of a sixth grade accelerated math program:

To find out about the students in accelerated math, I had to pursue several data sources: the current roster of students (middle school database), sixth grade scores on state exams (cumulative folders in the middle school guidance office), designation of mastery for eighth-graders on their sixth grade tests (testing and assessment database, located in the high school), and analysis of the scores against the current class lists.

That work, which required several weeks of effort, suggested some interesting findings. The initial insight was technological in nature: We lack an integrated database that could help us answer questions such as who has access to accelerated courses. ...A question from a parent opened the door to review of our math program and the realization that otherwise helpful data were too scattered to be immediately useful (King, 2000: 19).

This administrator, who appears to possess an exceptional commitment to using data for instructional decision-making purposes, is not in an exceptional situation in terms of her ability to access the data needed. Her story would characterize many districts.

Lacking clear standards and good assessment data, the concern is that too many teachers and administrators fall prey to easy, but unexamined, assumptions that standards are high, teachers are teaching effectively, and students are achieving at acceptable levels (Litow, 1999; Powell, Farrar & Cohen, 1985; Sanders, 1999;Sizer, 1984). If a school has neither clear grade level achievement standards nor standards-based assessments of achievement, it is hard to know whether instruction is effective. It also creates conditions in which ineffective teachers can be buffered from accountability or pressures to improve, while exemplary teachers go unrecognized, with the outcomes of their efforts remaining invisible within the organization. Substandard instruction and learning outcomes are not easily changed if they are not easily identified. Without benchmarks against which to gauge performance and data to support analysis of practice, many schools are rudderless and unable to do much about it.

Whether standards-based reforms can *fully* resolve these problems remains unclear, and is probably unlikely. There is little research specifically on this question, but findings of studies which can speak to this question support that the

absence of clear standards and instructional planning information is an obstacle to school effectiveness. A study comparing successful and unsuccessful schools implementing school-based management found that the successful managers of reform had "access to a wide variety of information on student, staff, and school performance, and used the information to guide decision making, to provide feedback to school constituents, and to enhance organizational learning" (Wohlstetter et al., 1997: 213). Other studies emphasize the costs deficient information and bad management: A large study of a systemwide school-based management initiative in Chicago delegating more authority and management responsibility to schools found that most schools did not improve, and a very large proportion, as much as one-third, actually got worse with planning and decision-making in schools crippled by conflict, inadequate information, and poor decision-making (Bryk, 1999). The efficacy of standards-based reform is still more assumed than documented, but there is hope that the gap between SBIA and practice in schools may be lessened by state laws implementing clearer and more ambitious standards, improved assessments of achievement, and stronger accountability sanctions.

Standards-based Reform and Information Technology: Making Standards and Performance Outcomes Clearer

Few would dispute that the standards-based reform movement has far to go. But at the same time we must not underestimate the scope of the challenge or overlook progress. The United States' education system is enormously decentralized and has been characterized by leading scholars as fragmented in its governance (Cohen & Spillane, 1993), loosely-coupled in its organizational structure (Weick, 1976), and suffused with cultural traditions making management practice and instructional methods highly resistant to change (Sarason, 1990; Stigler & Hiebert, 1999). Faced with these conditions, it will be neither quick nor easy to engender principles of SBIA in schools. Still, standards-based reform has produced some noteworthy systemwide changes.

Educational System Goals Are Clearer

Twenty years ago few states had educational goal statements specific enough to provide instructional guidance. Now virtually all states have extensive sets of written standards for curriculum content and student achievement referred to as content and performance standards (Gandal, 1997; Joftus & Berman, 1998). Content standards prescribe topics that must be covered and performance standards prescribe skills and abilities and specific expectations by certain grades.

As states have rewritten and revised these standards over time, the progression has been inexorably one way: states have made content and performance standards more comprehensive and more specific and strengthened their statutory authority. Over that past several decades state-prescribed education goals have become more comprehensive and specific. Content and performance standards have been prescribed at increasing numbers of grades in the K-12 sequence, in increasing numbers of subjects, and with broader scope of coverage at each grade level. In addition, state curriculum documents and policies are increasingly prescribing instructional procedures with examples to illustrate exemplary forms of student achievement (Archbald, 1999). To illustrate, compare a set of goal statements excerpted from U.S. History from Texas's standards, 1985 versus their current standards:

1985

Emergence of the U.S. as a world power.

- A) describe the causes and effects of United States involvement in foreign affairs and in international conflicts
- B) describe the United States international political, humanitarian, economic, and military cooperative efforts
- C) analyze the foreign policies of the United States and their impact on the nation

Current Standards

The student understands the emergence of the United States as a world power between 1898 and 1920. The student is expected to:

- (A) explain why significant events and individuals, including the Spanish-

American War, U.S. expansionism, Henry Cabot Lodge, Alfred Thayer Mahan, and Theodore Roosevelt, moved the United States into the position of a world power;

- (B) identify the reasons for U.S. involvement in World War I, including unrestricted submarine warfare;
- (C) analyze significant events such as the battle of Argonne Forest and the impact of significant individuals including John J. Pershing during World War I; and
- (D) analyze major issues raised by U.S. involvement in World War I, Wilson's Fourteen Points, and the Treaty of Versailles.

This kind of change has occurred in virtually all states (additional examples below). Educational goals, then, have been made clearer, more specific, and more uniform throughout state education systems. In fact, research indicates goals have become more uniform among states within the country (Gandal, 1997; Joftus & Berman, 1998; Raimi & Braden, 1998). A major component of standards-led education reform has been the production of influential national curriculum reports. (Note 4) As state curriculum committees across the country worked on revising and upgrading their own documents and standards they often looked to the national curriculum reports for guidance while sharing information through networking, conferences, and the like – activities which many observers believe have led to greater uniformity of standards among states.

Performance Measurement Has Improved

The amount of student achievement testing has increased steadily over the years, but more significant for the goals of SBIA, the sophistication of *performance measurement* has improved. During the 80s statewide testing programs expanded in scope, with testing expanding to cover more grade levels and more subjects (CCSSO, 1998; Clotfelter & Ladd, 1996; Linn, 2000). The 90s brought about four important changes.

First, there was growing recognition of the limitations of exclusive reliance on norm-referenced comparisons (Linn, 2000; Shepard, 1990). State testing programs became more criterion-referenced, with scores of students and school mean scores reported in relation to fixed benchmarks derived from published content and performance standards. In addition to reporting, “we are at the 55th percentile,” a school would report, “our average score is 3.2 on the 5 point scale, where 3.0 is the threshold described as ‘at standard’.”

Second, exclusive reliance on multiple choice formats gave way to mixed formats, tests with both multiple choice items and constructed response items. This in theory makes the tests more valid for measuring problem solving and knowledge integration. Many more states also started using writing tests in which students produce short essays graded by readers.

Third, states moved toward more analytical measures of school performance reporting. Educators and researchers have long understood that a school’s test scores are a function not just of the quality and effectiveness of its staff and programs, but also of the socioeconomic backgrounds of its students. Therefore, comparing schools on “raw” descriptive statistics, such as the mean of their students’ scores on a particular test, is not particularly useful (Meyers, 2000; Willms, 1992). High scoring schools almost always have low percentages of low-income students; vice versa for the low performing schools. By the late 80s many states began using more analytical measures of school performance. One approach is to adjust for student socioeconomic background and other characteristics considered exogenous to the school, so schools’ scores would be compared only to other demographically similar schools. Another approach (not mutually exclusive with demographic adjustments) is to report and evaluate schools’ scores on the basis of achievement gains (or losses) over time. Within these broad analytical reporting strategies there are a variety of more specific statistical methods. The main point, though, is over that last fifteen years state education agencies shifted toward the reporting of measures of school performance that are significantly more advanced than mere reporting of “raw” descriptive statistics (Linn, 2000).

Fourth, school performance measurement has increasingly included information beyond test scores. Other measures of performance have also been added to states’ systems for evaluating schools. These include graduation rates, percentages of students taking the SAT, and enrollments in college prep courses.

Clarifying Goals, Disseminating Performance Information, and Creating More Accessible Information

Educational standards and assessment results can aid decision-making and influence practice only if people know the standards and can access the assessment results. One obstacle to standards-based reform has been that teachers sometimes do not know much in detail about new standards documents (Archbald, 1997; Cohen, 1997); teachers have also confronted difficulties in accessing assessment results. The Internet, local computer networking, and electronic data interchange are overcoming some of these obstacles to access and understanding and therefore increasing the number of teachers and principals using information on standards and results for instruction and instructional management.

Prior to the advent of the Internet and computer networking for electronic data interchange, information about goals and performance was distributed exclusively in paper reports. Curriculum guides were printed and bound by state education agencies and then distributed to school district office personnel by mail or at conferences of district curriculum coordinators; district personnel in turn had the responsibility of distributing these documents to schools. It was generally expected that at least one copy would be available in schools' administrative offices and hoped that each teacher would have his/her own set, but this often depended upon the administrators' predilections and photocopying resources. The same general approach operated with respect to reports of school and school district performance on state tests, although unlike curriculum documents, test data (typically in the form of magnetic tape) would eventually also be sent to school districts.

Paper-based, manual distribution of information still occurs—however, there is a parallel process today of electronic information exchange. Virtually all school and district level decision-makers now have access to electronic information. Over 95% of schools have computers connected to the Internet and local area networks (NCES, 2000; NCES, 2001). (Note 5) The infrastructure is in place, then, to profoundly improve access to decision-support information about educational goals, standards, and performance. Throughout the nation, states and districts are using this IT infrastructure to do just that. The examples below are illustrative of typical web-based EDI concerning educational standards and school performance.

Information on state content and performance standards is accessed typically through a four step process of web navigation: (1) the state education agency website; (2) the office responsible for curriculum/instruction; (3) the link(s) to "standards;" (4) the link(s) to particular content areas and grade levels. Increasingly, standards documents are displayed in portable document format, but are also in rich text and ascii text formats. This maximizes their accessibility.

Figure 1 shows Virginia's web-based menu box for specifying the subject area and grade level standards.

View standards by subject area across all grade levels. (HTML)	View standards by grade level across all subject areas. (PDF format. Get the free adobe acrobat reader here)
History and Social Science ▾ Go	View standards by grade level ▾ Go

Figure 1. Typical Menu Box to Access Content/Performance Standards

Figure 2 shows a selection from the "Grade Eight Standards for Learning" from Virginia's content/performance standards documents, which are accessed on the web in portable document format.

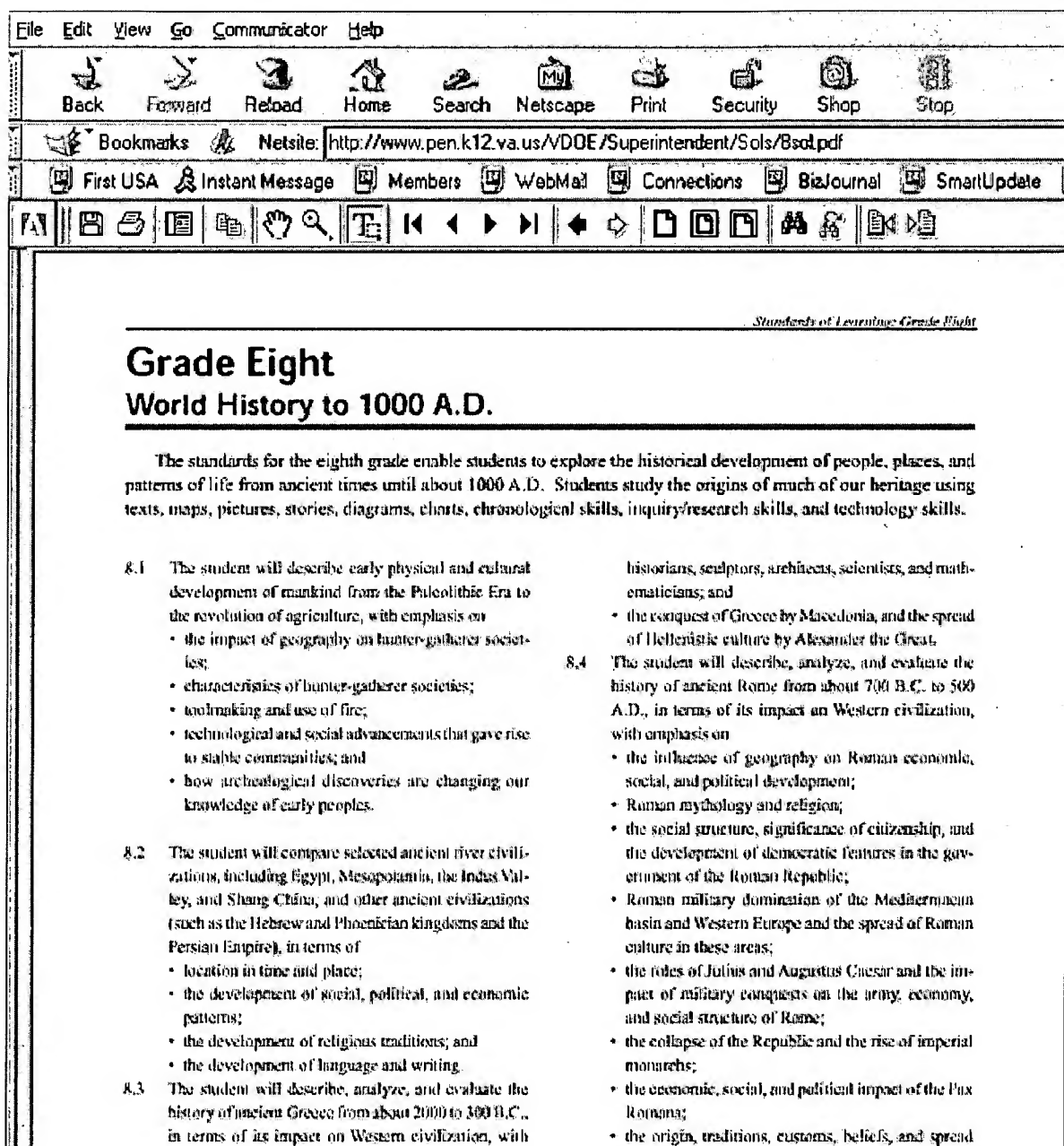








Figure 2. Excerpt from Virginia's Web-based Standards Document

Most states with web-based access to standards documents have relatively similar processes of access.

Distributing, revising, accessing, and using standards documents on the web is far easier and more efficient than managing paper reports. There are obvious efficiencies of distribution and revision. The information moves electronically instead of in cartons in trucks, and can be revised without incurring large re-distribution costs. (This is not to say frequent revision is a good idea—far from it.) More important from the perspective of SBIA, is that users always have access to the information. Teachers planning lessons or committees planning curriculum can immediately access the specific standards and areas of content they need for guidance. They can do it from home. Parents also can access the information. No one has to try to remember where their curriculum document is stored and ask for a new copy when they cannot find it.

Information on student and school performance is also increasingly on-line. Following are a few examples. Figure 3 shows the Delaware State Testing Program home page. The home page provides a great deal of background information on the state testing program, including an explanation of the scales used to represent student and school performance, sample items used in the state tests, and an on-line newsletter about the testing program and related assessment topics. Figure 4 shows the menu of selections for users to produce on-line reports of school level test

scores. A subsequent menu (not shown) allows users to select particular schools and to disaggregate results by student categories (race, gender, special ed, etc.). Figure 5 shows a report from a similar system in Arizona. The portable document format report of a selected school provides not only test score information, but information on staff, student enrollments, curriculum specialties, the school academic calendar, expenditures, discipline, and a other items of information. Figure 6 shows a hyper-text markup language report produced from data for the Chicago school district. This web-based system produces reports reflecting the results of value-added analyses computed at the school-level. The reports show whether a school's productivity trend over the last nine years is upwards, downwards, or flat. These examples are illustrative of the kind of school performance information that has become widely available on the web.

- NEW TO THIS SITE**
-  [April 14, 2001 Guidelines for Inclusion.](#)
The April 14, 2001 version of Guidelines for Inclusion will be used for 2001-2002 DSTP administrations
 -  [Item Samplers: Analyses of High School and Middle School DSTP Science Items](#)
 -  [Inclusive Comprehensive Assessment Project](#)
(Special Education and Limited English Proficient Student Accommodations Research and Limited English Proficient Student Projects)
 -  [Summary Report Science & Social Studies Fall 2000 Administration Grades 4 and 6](#)
 -  [Summary Report Science & Social Studies Spring 2000 Administration Grades 8 and 11](#)
 -  [When does student accountability begin?](#)

[Delaware Educational Directory](#)

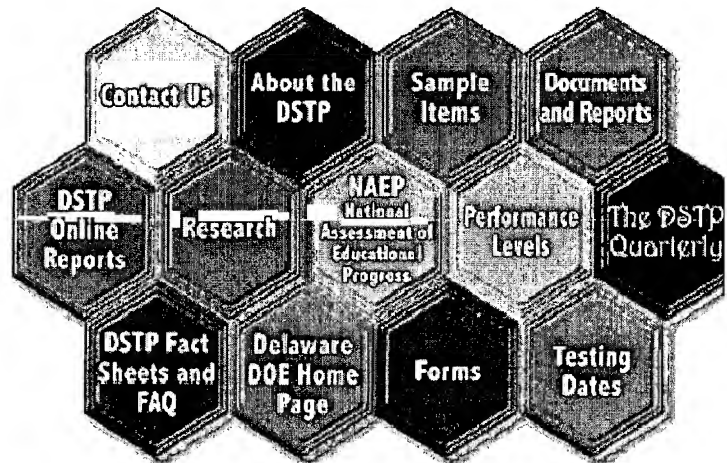


Figure 3. Web Homepage for Delaware State Testing Program (DSTP)

DELAWARE
STUDENT TESTING PROGRAM
ONLINE REPORTS
DELAWARE DEPARTMENT OF EDUCATION

I want information on the following tests ...

	<input type="checkbox"/> Spring 1999	<input type="checkbox"/> Spring 1999	<input type="checkbox"/> Spring 2000
Mathematics:	Grade 3	Grade 5	Grade 8
Reading:	Grade 3	Grade 5	Grade 8
Writing:	Grade 3	Grade 5	Grade 8

... taken by ...

☒ all students (or groups of students) statewide
☐ all students (or groups of students) in one or more selected districts
☐ all students (or groups of students) in one or more selected schools

DOE Home | DSTP Home

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Figure 4. Menu to Select Delaware School Level Test Score Results

BEST COPY AVAILABLE

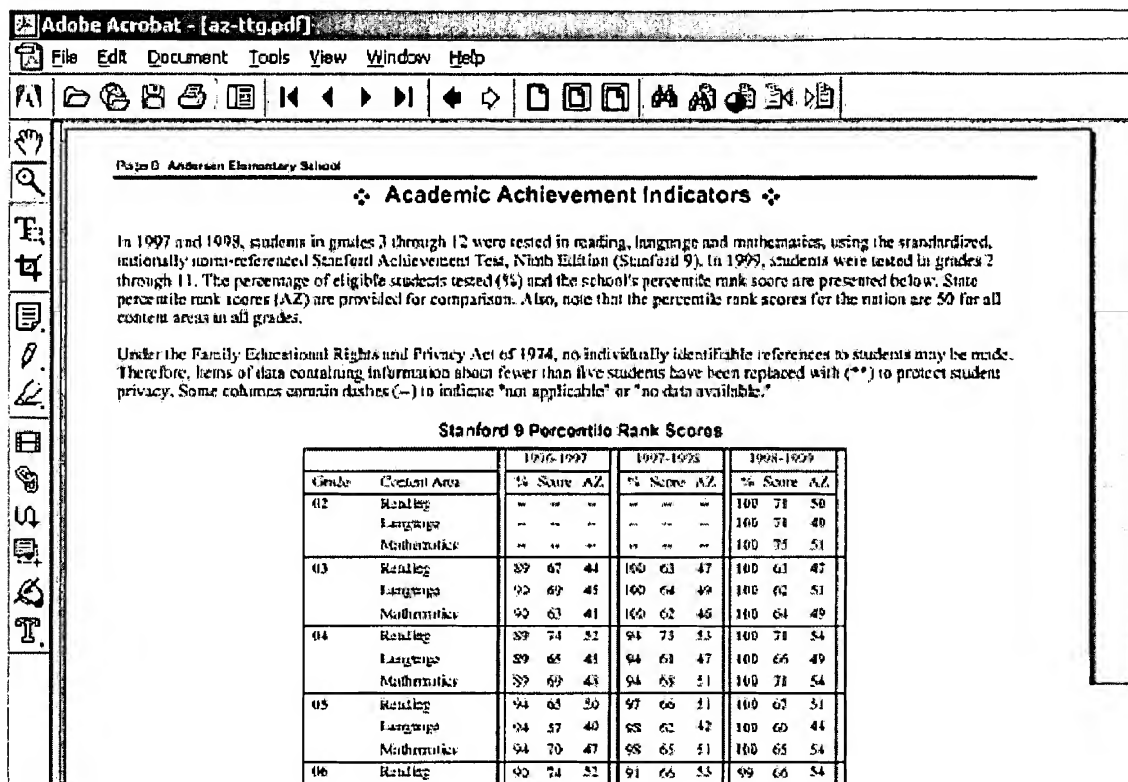
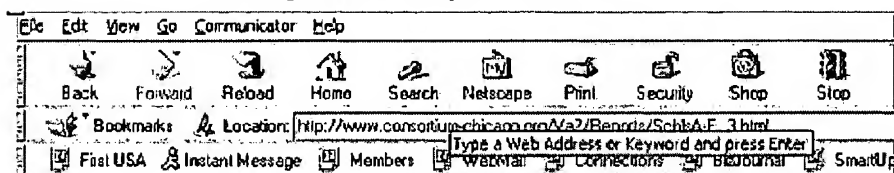


Figure 5 School Report Card: Arizona



School Improvement

CPS ITBS Test Results

Individual School Profiles

School	Mathematics							
	Grade 2	Primary Grade Trends		Intermediate Grade Trends		Upper Grade Trends		
		Output	Gain	Output	Gain	Output	Gain	Output
Van Vliissingen School	Up	Down	Up	Up	Up	Up	Up	
Abbott School	Down	Up	Flat	Up	Up	Up	Up	
Addams School		Down	Flat	Up	Flat	Up	Up	
Agassiz School	Up	Down	Up	Up	Up	Up	Up	
Alhany Park Multicultural Academy						Up	Up	

Figure 6. Gain Score Report from Chicago Public School System

The web-based information is intended for anyone with an interest in the performance of schools in a given locale (region or district) or in the performance of a particular school. Teachers, principals, and parents can evaluate the performance of "their" school in relation to standards and in relation to the performance of other schools; school board members, civic leaders, and policymakers can evaluate the performance of groups of schools in which they have an interest. The information reveals how well students are achieving in schools, identifies needs for

improvement, and depending upon the quality of the measurements, which schools are performing adequately and which schools are not. This creates a more efficient and rational basis for instructional management decision-making, and for allocating rewards, sanctions, and resources aimed at school improvement.

Before computer networking and electronic information exchange, performance data on schools was locked exclusively into paper reports that moved slowly through the organization, typically down the organizational hierarchy, from one office to the next. Often it was four or five months after testing before test score reports and other school reports were distributed throughout the organization. At the school level, administrators would typically have responsibility for disseminating test results among school faculty—a process carried out in a wide variety of ways, with widely varying efficiency, and often involving a lot of photo-copying. The same tasks and difficulties of paper report management described earlier with standards documents also affects the distribution and use of test score reports.

The web and EDI have changed this. Now, routinely, information from statewide testing is available over the web at the same time to everyone—teachers, parents, school principals, guidance counselors, district office curriculum coordinators, personnel supervisors, superintendents, and school board members. Many states and districts also make individual student achievement information available to authorized users (e.g., the child's teacher, guidance counselor, principal, and district data specialists). This has created substantially improved access to information for teacher-parent conferencing, for IEP meetings for special education students, and for instructional planning.

Some Conclusions About Progress Toward SBIA

Education critics are often quick to declare that reforms have failed when dramatic results are not seen after a few years. This perspective reflects an inadequate grasp of the scale and complexity of the education system and that schools' academic influence is shaped greatly by the level of support from home and the values of local communities and wider society. The progress described above in specificity of standards, performance measurement, and information access is significant and should be recognized. The quality of state content and performance standards for curriculum has unquestionably improved, owing to leadership among national curriculum organizations and to the growing stock of experience among dozens of state and district level standards committees. The quality of performance measurement has improved as a result of scholarly advocacy, advances in the psychometric field, and heightened awareness among policymakers and measurement specialists in education agencies. And the revolution in information technology brought to schools networked information systems that have given teachers and administrators much improved access to information on curriculum standards, school performance reports, and student and school profile characteristics.

The Next Challenge: Integrating SBIA Into Instructional Practice

The education policy changes described above have resulted from standards-based reform and developments in IT. Have these changes at the policy level affected instructional practice in schools? In its ideal formulation, SBIA requires that the planning, instruction, and assessment cycle be integrated *among* classrooms and grade levels. Standards of achievement should be clearly understood, consistent throughout the school, and guide unit and lesson planning. There should be easy access to student, instructional, and organizational data to monitor performance, to diagnose student needs and problems, and to develop improvement strategies. Undoubtedly, standards-based reform policies have made teachers and principals far more *aware* of prescribed standards and school performance outcomes today than a decade ago. But are standards-based reform and IT changing practices of instruction and instructional management within schools in ways more consistent with the SBIA model? Less is known about this.

We do know that IT *can* play an important role in facilitating standards-based reform and the implementation of SBIA *within* schools at the level of instructional practice. Relational data-base management technology and computer-based instructional management systems have gone far toward making SBIA *technically feasible*. The rapid rise of vendors and software programs for instructional management attests to this. There are a variety of instructional management and information technology systems now available. The goal of these systems is to use computer technology to improve the development and management of lesson plans, student academic records, and information about students' instructional experiences. Reflecting principles of standards-based reform, these instructional management systems almost always have features to link lesson and unit objectives to larger curriculum content and performance standards, whether these standards come from district, state, or national sources. These systems are also designed to manage student achievement records, such as grades and test scores, as well as to record instructional experiences such as lessons and tasks completed, books read, essays written, and the like.

While there is very little research specifically on the extent to which instructional management systems are effective in achieving the goals of SBIA within schools and classrooms, available research and theory suggest effectiveness will depend upon several factors:

Leadership And School Culture

Values and practices of leaders in the school can either encourage or discourage SBIA. Support for SBIA is created by values and practices such as: norms of collegial conversation that reflect on practice; frequent meetings to examine evidence on instructional practice, staff performance, or student achievement; commitments to professional

development and resource support for CRA; and statements, behaviors, and symbols that communicate values of trust, experimentation, and open communication. (Note 6) School leaders must be experienced, committed, and knowledgeable in order to create these conditions.

Often, these conditions do not occur. Instead of trust, teachers or principals may be suspicious that information will be used against them or simply unmotivated to pursue the advantages computers may bring (KHEC, 2000; Stiggins, 2001). Such fears are reinforced when test scores are publicly reported and lead to simplistic media proclamations about "poor teaching and failing schools" or are used inappropriately by uninformed district officials. Another factor militating against the development of cultures conducive to SBIA is past negative experiences with instructional management or student information technologies (Rosen & Weil, 1995). It was not until well in to the 90s that faster CPUs, greater storage capacity, faster connections, better graphical user interfaces and other IT advances made more user-friendly systems possible. During the developmental days of computers in the 80s and even into the 90s untold many schools and districts across the country hastily adopted computer-based instructional management and student information systems sold with promises and attractive presentations, only to find the systems actually complicated, cumbersome, time-consuming, and difficult to use. Frustrating early experiences with computers have left many personnel in schools skeptical about new "technology solutions" promised by technology advocates outside the school.

Personnel Technical Proficiency

There is no getting around the fact that for SBIA to be integrated into instructional practice all or nearly all of the school's faculty and administrators must have a certain level of computer proficiency. While SBIA does not technically require computers, neither does organizing and retrieving information in libraries. But card catalogues and 800-page indexes of serials are essentially obsolete because of computers. Computers and well designed instructional management software are needed to fully realize the potential of SBIA to promote uniform standards within a school, to track student progress through the year and among grades, to report information to users, and to analyze and evaluate results.

Despite the ubiquity of computers in schools, teachers and administrators are still predominantly of the pre-computer generation. Many are still reluctant computer users and limited to fairly simple procedures, such as word processing or web-browsing (Cooley, 1998; OTA, 1995). Compared with prescribed standards of proficiency (e.g., Coughlin, 1999; ISTE, 2000), the proportion of teachers and principals proficient for more advanced computing uses remains relatively small. With respect to the proficiencies required for data-driven decision-making, for instance, a prominent ULCA education research center describes school decision-makers as "woefully underprepared to use data [to document results] and for planning and decision-making purposes" (Linn & Baker, 1999). (Note 7) Several reports indicate that school districts generally give insufficient attention and resources to training teachers to gain needed proficiencies with educational technology—about half as much as they should (MDR, 2000; OTA, 1995).

Technical Obstacles

Information management systems themselves may have shortcomings that frustrate and impede the goals of users. Administrators and teachers have very little "down time" during the day and so systems must be designed to provide needed information quickly and easily. While a reasonable level of computer proficiency can be expected, teachers and administrators cannot all be expected to be advanced computer users. The systems must be designed to the maximum extent feasible around the habits and needs of users, rather than users having to adapt inadequately designed systems to the unique conditions in schools and needs of school-based users. Here are a few issues that designers of these systems must consider.

All schools have some turnover of students over the course of the school year and many schools have high levels of student turnover. According to one national estimate, one out of six children will attend three schools by the time they are in third grade (GAO, 1994). It is therefore essential to develop procedures to insure that student databases are current and easy to update. When a new student arrives in a school, the registration information must be entered immediately into the data system and appropriate records up dated. It is a waste of time and discourages reliance on data for planning and decision making if teachers or administrators attempt to use a system and frequently encounter missing or out-of-date information.

A closely related issue is linkages between databases. Functionality decreases to the degree that an information management system is unable to pull together current information from different databases. If student demographic and registration information cannot be easily linked with student achievement information and student achievement information cannot be linked with curricular or discipline information, the usefulness of the data declines markedly. It is not enough that the data exist, they must be cross-referenced and easily queried by users.

A third issue concerns the quality of instructional and achievement data. Relatively detailed information is needed for instructional planning. Ideally, SBIA requires at least three types of information: standards-based assessment information, at least once per marking period, from tests and tasks closely aligned with the school's curriculum; state/district achievement test information; and instructional information at the student level related to curriculum objectives. State testing information by itself is inadequate. As Clements (2000) observed:

The decision support systems now under development generally contain the accountability data, because they are the data that are available. These data are considered to be of sufficient quality to warrant widespread use for school and district comparisons and to highlight where effective practice seems to be occurring. While these data may be useful to some decision-makers looking for places where assistance is needed, the data appear to have limited use to teachers and principals seeking to improve what they are doing. (p. 3).

A fourth set of issues concerns the accessibility of the information. Teachers and administrators must be able to use the systems easily. As stated earlier, users should be expected to be proficient with common software programs and commands and basic principles of data analysis and management. At the same time, the systems must be tailored to the needs and proficiency levels of this audience. This means that users must be able to access and query the system from their own computers and produce useful reports as needs arise, without having to struggle with manuals, engage in frequent trial and error, navigate through dozens of screens, and frequently solicit technical consultation. If these standards of ease and functionality cannot be achieved, teachers and principals will of course continue to make instructional and management decisions – only the decisions will be made on the information at hand, however anecdotal, unsystematic, or incomplete it may be.

The variables above are some of the most important that will determine the benefits to be derived from the “next generation” of IT-based instructional management systems for schools. Most schools and districts are still struggling with the challenges of converting existing paper-based data systems to electronic formats and connecting multiple, separate databases to create more integrated, warehoused data management systems. Today in most districts, school-based personnel can access electronically (a) information on state curriculum content standards and schoolwide profile reports and (b) information on individual students from student records. However, the information of type (a) is in aggregate form and has been compiled by others, while information of type (b) is typically limited to registration, scheduling, and report card information and is difficult to aggregate and analyze. Further, it is typically not the case that all teachers can access information of types (a) or (b) easily from their classrooms on an “as needed” basis. The goal of “next generation” IT systems is to surmount the school-level leadership, personnel proficiency, and technical variables to implement systems that can place at the teachers’ fingertips the information necessary to fully realize the vision of SBIA (Means, 2000). This can bring standards-based reform more effectively to the classroom level. Then, perhaps, we will see payoffs in rising student achievement.

Notes

¹ Otto, Wolf & Eldridge (1984), based on a review of reading research, conclude that “when teachers do more ongoing diagnosis and utilize information in planning appropriate instruction, achievement scores tend to be higher” (p. 814).

² See also Elmore, Peterson & McCarthy (1996) for a study finding highly varied adaptations of reading instruction among elementary teachers in “restructured” schools. Also, see CCSSO (2000).

³ For studies documenting management dysfunctions in public education systems, see Ascher (1996); Bryk (1999); Hess (1999); Hula, Jelier & Schauer (1997); Olson (1997); Litow (1999); Mattoon & Test (1995); Ravitch & Viteritti (1997); and Ravitch (1999). These studies describe problems of educational management and instructional planning stemming from poor information, inability to conduct strategic planning, and political influences.

⁴ In many ways 1989 was the apogee of standards-based reform advocacy. President Bush and the nation’s governors at the Charlottesville Education Summit called for a nationwide commitment to higher academic standards; 1989 brought the publication of three key national “standards” reports, *Everybody Counts* (National Research Council), *Science for All Americans* (American Association for the Advancement of Science), and *Curriculum and Evaluation Standards for School Mathematics* (National Council of Teachers of Mathematics). Reports in other subjects followed shortly. *Building a History Curriculum: Guidelines for Teaching History in Schools* (Bradley Commission on History in Schools), *Curriculum Guidelines* (National Council for the Social Studies), and *Charting a Course: Social Studies for the 21st Century* (National Commission on Social Studies in the Schools).

⁵ Becker in 1994 reported that over the three years between 1989 and 1992, the number of computers in U.S. schools grew by 300,000 to 400,000 per year.

⁶ For more on this see Barth (1990); Leithwood & Aitken (1995); and Senge (2000).

⁷ For more on this, see Hurst (1997), President’s Committee (1997) and Streifer (1997). Computer availability and information technology are most inadequate in districts on the low-income, low-tech side of the “digital divide” (President’s Committee, 1997).

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Education Policy Analysis Archives

Volume 9 Number 49

November 24, 2001

ISSN 1068-2341

A peer-reviewed scholarly journal

Editor: Gene V Glass

College of Education

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Computing Experience and Good Practices in Undergraduate Education: Does the Degree of Campus "Wiredness" Matter?

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Citation: Hu, S. and Kuh, G.D. (2001, November 24). Computing Experience and Good Practices in Undergraduate Education: Does the Degree of Campus "Wiredness" Matter?, *Education Policy Analysis Archives*, 9(49). Retrieved [date] from <http://epaa.asu.edu/epaa/v9n49.html>.

Abstract

Responses to the *College Student Experience Questionnaire* 4th Edition from 18,844 students at 71 colleges and universities were analyzed to determine if the presence of computing and information technology influenced the frequency of use of various forms of technology and other educational resources and the exposure to good educational practices. Undergraduates attending "more wired" campuses as determined by the 1998 and 1999 *Yahoo! Most Wired Campus* survey more frequently used computing and information technology and reported higher levels of engagement in good educational practices than their counterparts at less wired institutions. Non-traditional students benefited less than traditional students, but both women and men students benefited comparably from campus "wiredness."

Introduction

An increasingly technology-oriented workplace makes competence in computer and information technology essential (Gilbert, 1996; Green & Gilbert, 1995; Morrison, 1999; West, 1996). Thus, it is no surprise that computing and information technologies have proliferated on most campuses and now typically represents a substantial share of an institution's operating budget (Finkelstein, Frances, Jewett, & Scholz, 2000; Institute for Higher Education Policy, 1999). Continuously upgraded, the technology is supposed to add value to the student experience. E-mail, for example, promises to remove time and distance barriers between students and faculty members (Gilbert, 1995; D'Souza, 1992) and students are generally satisfied with this mode of communication, reporting that it has a positive effect on the learning process (D'Souza, 1992), especially when faculty members use email to elaborate on key points made during class discussions and provide feedback to students (D'Souza, 1992; Hawarth, 1999; Roach, 1999).

Assuming the benefits of email extend to the use of other forms of electronic technologies, it seems plausible that more is better, meaning that the more pervasive the technology the more students will use it and the more they will benefit. However, relatively few studies have looked specifically at the relationships between computing and information technology and the overall undergraduate experience. It's also possible that prospective students consider the degree to which an institution is "wired" (i.e., the availability of advanced forms of computing and information

technology) when deciding to which schools they will apply and ultimately, the specific college they will attend (Armstrong, 2000; Bernstein, Caplan, & Glover, 2000; Jackson, 2000).

Some studies are encouraging, showing positive influences of the use of information technology on a broad range of desired outcomes of college (Flowers, Pascarella, & Pierson, 2000; Kuh & Vesper, 2001; Pew Internet and American Life, 2000). At the same time, others worry about potentially undesirable consequences of the overwhelming presence of computer and information technology (Upcraft, Terenzini, & Kruger, 1999). For example, Wen (2000) reported that as more and more adolescents grow up communicating via instant electronic messaging, chat rooms and email, they would be isolated from and have little experience with face-to-face human contact. Though the Internet offers almost unlimited access to information, some caution that it must not become "a substitute for hands-on learning" (Malveaux, 2000, p. 38). In addition, it is not clear whether the availability and use of technology promotes or discourages student engagement in good educational practices, behaviors that are linked with a host of desirable college outcomes (Chickering & Gamson, 1987). Haworth (1999) suggests that e-mail does not increase the frequency of student-faculty interaction, but rather allows it to take a different form.

Peers and faculty members are the two most important agents of socialization for students in college (Pascarella & Terenzini, 1991; Weidman, 1989). One way to determine the impact of computing and information technology on the quality of undergraduate education is to examine the relationship between the degree to which a campus is wired and the level of student engagement in a range of empirically-derived good educational practices (Chickering & Gamson, 1987). Included among such good practices are student-faculty contact, peer cooperation, and active learning.

Purpose

This study examines the relationships between the availability of computing and information technology (wiredness), use of the technology, and student engagement in three good educational practices (faculty contact, peer cooperation, active learning). Two questions guide this study.

First, does highly accessible, advanced forms of computing and information technology have a demonstrable effect on students' experiences with this technology and their exposure to good educational practices? That is, do students use technology more frequently and interact more frequently with their teachers, engage in more cooperative peer activities, and have more active learning experiences on wired campuses compared with their counterparts at less wired campuses?

Second, does the degree of campus wiredness have differential effects on the experiences of different types of students (men and women, traditional age and older students)? Previous studies have reported certain differences in how men and women use computing and information technology (Kuh & Hu, 2001; Pew Internet and American Life, 2000). However, it is not known whether there are differences in the relationships between campus wiredness and students' experiences with information technology and their exposure to good educational practices depending upon student characteristics such as gender or age.

Methods

Data Source and Instrument

The data used in this study are from the College Student Experiences Questionnaire (CSEQ) research program. The fourth edition of the CSEQ (Pace & Kuh, 1998) is designed for students attending four-year colleges and universities and gathers information about students' background (age, major field, and so forth) and their experiences in three areas. The first area is the amount of studying, reading, and writing students do and the time and energy (quality of effort) they devote to various activities measured by items contributing to 13 Activities Scales. One of these scales, Computer and Information Technology (C&IT), is composed of nine items describing various forms and uses of computers and information technology that we will discuss later in the paper. The response options for all Activities items are: 1="never," 2="occasionally," 3="often," and 4="very often."

The second area includes 10 Environment items representing student perceptions of the extent to which their institution emphasizes important conditions for learning and personal development. Student responses are scored on a 7 point scale ranging from "strong emphasis" = 7 to a "weak emphasis" = 1.

The final set of questions asks students to estimate the extent to which they have made progress since starting college in 25 areas that represent desired outcomes of higher education. Response options for the Gains items are: 1="very little," 2="some," 3="quite a bit," and 4="very much."

The validity of self-reported information such as that obtained by the CSEQ has been thoroughly examined (Baird, 1976; Lowman & Williams, 1987; Pace, 1985; Pike, 1995; Turner & Martin, 1984). Generally, self-reported information is likely to be valid if five conditions are met: (1) if the information requested is known to the respondents, (2) the questions are phrased clearly and unambiguously (Laing, Sawyer, & Noble, 1988), (3) the questions refer to recent activities (Converse & Presser, 1989); (4) the respondents think the questions merit a serious

and thoughtful response (Pace, 1985), and (5) answering the questions does not threaten, embarrass, or violate the privacy of the respondent or encourage the respondent to respond in socially desirable ways (Bradburn & Sudman, 1988). CSEQ items satisfy all these conditions. The questionnaire requires that students reflect on what they are putting into and getting out of their college experience. The items are clearly worded, well defined, and have high face validity. The nature of the questions refers to common experiences of students during the current school year, typically a reference period of about six months or less. The format of most response options is a simple rating scale that helps students to accurately recall and record the requested information, thereby minimizing this as a possible source of error. The Estimate of Gains items ask students to make a value-added judgment (Pace, 1990) and student responses to such questions are generally consistent with other evidence, such as results from achievement tests (Brandt, 1958; DeNisi & Shaw, 1977; Hansford & Hattie, 1982; Lowman & Williams, 1987; Pace, 1985; Pike, 1995). For example, Pike (1995) found that student reports to Gains items from the CSEQ were highly correlated with relevant achievement test scores and concluded that self reports of progress could be used as proxies for achievement test results if there was a high correspondence between the content of the criterion variable and proxy indicator. Based on their review of the major college student research instruments, Ewell and Jones (1996) concluded that the CSEQ has excellent psychometric properties and high to moderate potential for assessing student behavior associated with college outcomes.

The measure of the extent to which an institution is wired ("wiredness") was from the "most wired" survey of college campuses conducted by *Yahoo! Internet Life* magazine in 1998 and 1999, the same years the data for this study were collected. The "most wired" survey collects information about a variety of factors related to information technology access and infrastructures (e.g., number of wired classrooms and dorms), general institutional support (e.g., library resources, email accounts), administrative services (e.g., on-line course registration, advising), and student support (e.g., technical support, orientation). Although somewhat controversial, more than 1,000 institutions participated in the most recent survey (Young, 2000). Because the 1998 and 1999 rankings of campus wiredness for the 100 most wired campuses are somewhat unstable, we coded campus wiredness as a dichotomous variable. Thus, those colleges and universities that were ranked in either year were considered to be among the "more wired campuses" and those that were not ranked were categorized as "less wired."

Sample

The sample is composed of 18,344 undergraduates from 71 four-year colleges and universities who completed the 4th edition of the CSEQ in 1998 and 1999. The schools include 21 research universities (RU), 9 doctoral universities (DU), 22 comprehensive colleges and universities (CCU), 8 selective liberal arts colleges (SLA), and 11 general liberal arts colleges (GLA) as classified by The Carnegie Foundation for the Advancement of Teaching (1994). Although the mix of schools reflects the diversity and complexity of four-year colleges and universities, for all practical purposes the CSEQ database constitutes a convenience sample in that institutions administer the instrument in different ways and for different reasons. Women (63%), traditional-age students (92%), first-year students (48%), and students from private colleges are over-represented in the sample compared with the national profile of undergraduates attending four-year colleges and universities. About 77% were White students, 8% Asian Americans, 6% African Americans, 6% American Indians and students from other backgrounds and 4% Latinos. Also, more than half of the students were majoring in a pre-professional area, 17% in math and science, 10% in social science, and 8% in humanities. Almost one-fifth (19%) had majors from two or more of the major field categories. Among the 71 institutions in this study, 21 were more wired campuses with 29% of students and 50 were less wired campuses with 71% of students in the sample.

Variables

Because socioeconomic status (SES) and student ability are highly correlated and affect college outcomes (Pascarella & Terenzini, 1991), two control variables were created, student SES and academic preparation. SES was represented by level of parents' education and the amount parents contributed to college costs. This estimate of SES is not a robust measure of socioeconomic status, but it is the best approximation possible from the variables included on the CSEQ. Academic preparation is the sum of student self-reported grades and educational aspirations. In addition, institutional selectivity and control (public, private) were also controlled in all analyses with the selectivity measures taken from *Barron's Profiles of American Colleges* (1996). Student gender, race and ethnicity, major field, institutional type, and year in college were coded as dummy variables. The variables were coded as follows:

- Sex (0=women, 1=men);
- Age (0=traditional-age students under age 24, 1=students 24 and older);
- Race or ethnicity was coded as a set of dummy variables: Asian Americans, African Americans, Latinos, Whites, and Other Ethnicity (American Indians and others), with Whites as the omitted reference group;
- SES (the sum of parent education where 1=neither parent a college graduate, 2=one parent a college graduate, and 3=both parents college graduates and amount parents contribute to college costs where 1=none to 6=all or nearly all);
- Academic preparation (the sum of grades where 5=A and 1=C, C- or lower and educational aspirations where 2=expect to pursue an advanced degree after college and 1=does not expect to pursue an advanced degree);
- Major field (humanities, mathematics and sciences, social sciences, pre-professional, and students in two or more major fields, with pre-professional omitted as reference group);
- Institutional type (RU, DU, CCU, SLA, GLA with RU omitted as reference group);
- Institutional control (0=public, 1=private);

- Institutional selectivity (6=most competitive, 5=highly competitive, 4=very competitive, 3=competitive, 2=less competitive, and 1=not competitive);
- Year in college (first-year, sophomore, junior, and senior, with first-year omitted as reference group);
- Colleges and universities that were ranked in either year were considered to be among the "more wired campuses" (coded as 1) and those that were not ranked were categorized as "less wired" (coded as 0);
- Overall C&IT score (the sum of individual C&IT item scores). The psychometric properties for the computer and information technology scale are acceptable, with a reliability alpha of .78. The interrelationship between C&IT items ranges from .102 to .735. The nine C&IT items are:
 1. Used a computer or word processor to prepare reports or papers.
 2. Used e-mail to communicate with an instructor or other students.
 3. Used a computer tutorial to learn material for a course or developmental/remedial program.
 4. Participated in class discussions using an electronic medium (e-mail, list-serve, chat group, etc.).
 5. Searched the World Wide Web or Internet for information related to a course.
 6. Used a computer to retrieve materials from a library not at this institution.
 7. Used a computer to produce visual displays of information (charts, graphs, spreadsheet, etc.).
 8. Used a computer to analyze data (statistics, forecasting, etc.).
 9. Developed a Web page or multimedia presentation.

The engagement measures included the three good practice indicators: student-faculty contact, cooperation among students, and active learning. The items in each good practice indicator and the psychometric properties of the scales are presented in Appendix.

Data Analysis

The analysis was performed in two steps. First, we used analysis of covariance (ANCOVA) to estimate the impact of campus wiredness on the nature and frequency of computer and information technology use, including each of nine different uses ranging from "writing papers" to "developing web page and multimedia presentations" as well as an overall measure of use of C&IT defined as the sum of the frequency of the nine types of use. Then, we used multivariate analysis of covariance (MANCOVA) to estimate a covariate model of the influence of campus wiredness on the good practice variables, such as student-faculty contact, peer cooperation, and active learning. The independent variable was the dichotomized measure of campus wiredness (more wired was coded 1 and less wired coded 0). We then repeated the analyses for both men and women separately to determine whether the relationships between campus wiredness, uses of technology, and student engagement in the three good practices differed for men and women. Finally, we repeated these analyses for both traditional and non-traditional students.

We calculated the effect size of campus wiredness (more wired vs. less wired) on the outcome variables following Cohen's (1977) suggestions where anything below .20 was considered a trivial effect, between .20 and .50 a small effect; between .50 and .80 a medium effect; and above .80 a large effect.

Results

Table 1 presents the descriptive statistics of the indicators on computing experience and good practices for all students and students in more wired and less wired campuses. The three most frequent C&IT activities were using a computer for word processing, using e-mail to communicate with an instructor or classmates, and searching the Internet for course material (Table 1). The three least frequent C&IT activities were developing a Web page or multimedia presentation, participating in class discussions via an electronic medium, and retrieving off-campus materials. This trend is similar for students at both more wired and less wired campuses, but "using a computer tutorial" was among the least frequent activities for students at less wired campuses. Students at more wired campuses had slightly higher average scores on eight of nine computing items (tied for retrieving off-campus library materials) and the total computing experience. The three good practice measures also very slightly favored students at wired campuses.

Table 1
Descriptive Statistics of Campus Wiredness, Computing Experience,
and Good Practices

VARIABLES	All		More Wired		Less Wired	
	Mean (%)	S.D.	Mean (%)	S.D.	Mean (%)	S.D.
1. Used computer/word processor for paper	3.72	0.61	3.76	0.56	3.71	0.63
2. Used e-mail to communicate with class	3.41	0.92	3.61	0.76	3.33	0.97
3. Used computer tutorial to learn material	1.88	1.00	2.08	1.07	1.79	0.95
4. Joined in electronic class discussions	1.71	1.00	1.90	1.08	1.64	0.96
5. Searched Internet for course material	3.16	0.92	3.25	0.89	3.12	0.93
6. Retrieved off-campus library materials	1.80	1.01	1.80	1.03	1.80	1.00

7. Made visual displays with computer	2.36	1.06	2.47	1.07	2.31	1.05
8. Used a computer to analyze data	1.95	1.03	2.05	1.07	1.91	1.01
9. Developed Web page, multimedia presentation	1.63	0.94	1.72	1.02	1.59	0.91
C&IT Overall Score	21.61	5.19	22.65	5.36	21.19	5.06
Good Practice Indicators						
Faculty-Student Contact	23.01	5.58	23.04	5.43	23.00	5.64
Student Cooperation	20.80	4.74	20.84	4.72	20.78	4.74
Active Learning	41.87	7.57	42.19	7.65	41.74	7.53
N	18,344		5,315		13,029	

Tables 2 and 3 compare the computing experiences and exposure to good educational practices at more and less wired campuses by sex and age. Again, the same general patterns of using computer and information technology were evident. The three most frequent C&IT activities were using a computer for word processing, using e-mail to communicate with an instructor or classmates, and searching the Internet for course material. The three least frequent C&IT activities were developing a Web page or multimedia presentation, participating in class discussions via an electronic medium, and retrieving off-campus materials (or using computer tutorial). Men and women who attended a more wired campus had slightly higher average scores on eight of nine computing items (tied for retrieving off-campus library materials) and the total computing experience. Consistent with the findings reported by Kuh and Hu (in press), men used C&IT slightly more frequently than women and also preferred more advanced forms of C&IT. Women opted more often for word processing and e-mail, with men more frequently using visual displays, data analysis, and multimedia presentation options.

The general pattern of more frequent use of technology favoring more wired campuses was also true for traditional-age students. However, non-traditional (older) students showed a somewhat mixed pattern, though the overall computing score (C&IT) favored students at the more wired campuses with the advantage due primarily to the more frequent use of the more common forms of C&IT such as e-mail.

Table 2
Descriptive Statistics of Computing Experience & Good Practices
By Gender in More and Less Wired Campuses

VARIABLES	Men				Women			
	More Wired		Less Wired		More Wired		Less Wired	
	Mean (%)	S.D.	Mean (%)	S.D.	Mean (%)	S.D.	Mean (%)	S.D.
Computing Experiences								
1. Used computer/word processor for paper	3.72	0.60	3.66	0.61	3.79	0.53	3.74	0.61
2. Used e-mail to communicate with class	3.51	0.81	3.19	0.92	3.66	0.73	3.40	0.93
3. Used computer tutorial to learn material	2.09	1.05	1.86	1.00	2.07	1.08	1.76	0.94
4. Joined in electronic class discussions	1.94	1.09	1.68	1.00	1.88	1.07	1.61	0.95
5. Searched Internet for course material	3.23	0.87	3.10	0.92	3.27	0.90	3.13	0.94
6. Retrieved off-campus library materials	1.89	1.05	1.87	1.01	1.75	1.02	1.76	0.99
7. Made visual displays with computer	2.54	1.04	2.46	1.06	2.43	1.08	2.22	1.04
8. Used a computer to analyze data	2.22	1.09	2.15	1.03	1.95	1.05	1.77	0.96
9. Developed Web page, multimedia presentation	1.94	1.09	1.76	0.94	1.59	0.95	1.49	0.83
C&IT Overall Score	23.07	5.63	21.73	5.19	22.39	5.18	20.88	4.78
Good Practice Indicators								
Faculty-Student Contact	23.01	5.58	22.98	5.58	23.05	5.34	23.00	5.55
Student Cooperation	20.46	4.83	20.35	4.74	21.06	4.63	21.03	4.67
Active Learning	41.21	7.58	40.67	7.57	42.77	7.64	42.36	7.36
N	1,987		4,777		3,328		8,252	

Table 3
Descriptive Statistics of Computing Experience & Good Practices
by Age at More and Less Wired Campuses

VARIABLES	Traditional				Non-Traditional			
	More Wired		Less Wired		More Wired		Less Wired	
	Mean (%)	S.D.	Mean (%)	S.D.	Mean (%)	S.D.	Mean (%)	S.D.
Computing Experiences								
1. Used computer/word processor for paper	3.77	0.53	3.73	0.61	3.54	0.86	3.54	0.81

2. Used e-mail to communicate with class	3.64	0.72	3.39	0.92	2.94	1.10	2.66	1.12
3. Used computer tutorial to learn material	2.09	1.07	1.79	0.95	1.84	0.99	1.85	1.00
4. Joined in electronic class discussions	1.91	1.08	1.64	0.97	1.60	0.90	1.59	0.92
5. Searched Internet for course material	3.27	0.88	3.13	0.93	3.02	1.01	2.99	0.99
6. Retrieved off-campus library materials	1.80	1.03	1.79	1.00	1.90	1.07	1.91	1.01
7. Made visual displays with computer	2.47	1.07	2.31	1.05	2.40	1.07	2.33	1.07
8. Used a computer to analyze data	2.06	1.07	1.91	1.01	1.90	1.02	1.95	1.05
9. Developed Web page, multimedia presentation	1.73	1.02	1.59	0.91	1.60	0.87	1.63	0.91
C&IT Overall Score	22.74	5.32	21.27	4.98	20.74	5.76	20.44	5.68
Good Practice Indicators								
Faculty-Student Contact	23.08	5.39	23.07	5.65	22.17	6.01	22.29	5.50
Student Cooperation	20.93	4.71	20.99	4.75	18.94	4.41	18.76	4.20
Active Learning	42.12	7.65	41.59	7.56	43.56	7.51	43.19	7.08
N	5,068		11,805		247		1,224	

The differences in the three good practice indicators for students at more or less wired campuses were small and mixed in direction. Women had higher scores on the good practice indicators at both more and less wired campuses. Traditional-age students reported more contact with their faculty members and more interactions with their peers compared with older, non-traditional students. At the same time, non-traditional students were more engaged in active learning activities than were traditional students (Table 3).

To better understand the relationships between campus wiredness and student experiences with computing and information technology and good educational practices, we must control the potentially confounding effects of student background and institutional characteristics such as control and selectivity. Table 4 presents the results from the ANCOVA and MANCOVA analyses that take these confounding effects into account.

Overall, students on more wired campuses were much more likely to use computer and information technology (an effect size of .32). This means that students at the "more wired" schools had on average about a .32 standard deviation advantage in the overall use of computer and information technology compared with their counterparts attending less wired institutions. This pattern was consistent for all nine forms of the technology represented on the CSEQ, though the effect sizes were generally small and in some cases trivial. This pattern of computing experience was consistent for men, women, and traditional students. However, the degree of wiredness did not affect older, non-traditional students except with regard to the use of e-mail, which favored students at the more wired campuses.

Table 4
Effect Size of Campus Wiredness on
Student Computing Experiences & Good Practices

	All	Men	Women	Traditional	Non-Traditional
ANOVA					
1. Used computer/word processor for paper	0.10*	0.12*	0.09*	0.10*	0.06
2. Used e-mail to communicate with class	0.23*	0.31*	0.19*	0.23*	0.29*
3. Used computer tutorial to learn material	0.28*	0.25*	0.29*	0.29*	0.00
4. Joined in electronic class discussions	0.24*	0.26*	0.24*	0.26*	0.00
5. Searched Internet for course material	0.17*	0.20*	0.16*	0.18*	0.01
6. Retrieved off-campus library materials	0.09*	0.11*	0.07*	0.09*	0.09
7. Made visual displays with computer	0.23*	0.20*	0.25*	0.23*	0.11
8. Used a computer to analyze data	0.20*	0.18*	0.22*	0.21*	0.01
9. Developed Web page, multimedia presentation	0.18*	0.24*	0.14*	0.19*	0.00
C&IT Overall Score	0.32*	0.35*	0.31*	0.33*	0.13
MANOVA					
Faculty-Student Contact	0.08*	0.11*	0.06*	0.08*	0.07
Student Cooperation	0.02	0.06	0.00	0.02	0.04
Active Learning	0.11*	0.13*	0.09*	0.11*	0.10

<i>N</i>	18,344	6,764	11,580	16,873	1,471
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Note: Effect sizes over .20 were bolded; Less wired campuses were the reference group; * $p < .001$.

Statistically significant differences for student-faculty contact and active learning favored all but non-traditional students at the "more wired" campuses. However, because the effect sizes were lower than .20 these differences are not likely to have any practical importance. No differences were found with regard to peer cooperation for students as a whole or for any sub-group nor was campus wiredness related to the experiences of non-traditional students with any of the three good educational practices.

Limitations

This study is limited in several ways. First, the measures of C&IT and other student experiences used in the study were limited to those represented on the CSEQ. The CSEQ C&IT items do not exhaust the ever-expanding range of possible computing and information technology available to students on many campuses that conceivably could affect their learning in positive or negative ways. For example, instructor-designed use of hypermedia and hypertext are not specifically mentioned nor are activities that represent non-educational uses of C&IT such as surfing the Web or playing games. Thus, these data do not shed light on such potential debilitating behaviors associated with C&IT such as Internet addiction or cocooning (Kandell, 1998; Reisberg, 2000).

Second, this study is based on a convenience sample of institutions participating in the CSEQ research program from a recent two-year period. If data from other institutions were available or a longer time period was covered perhaps the results would differ. Also, the measure of campus wiredness is based solely on the *Yahoo! Internet Life* survey. Other sources of data about the availability and use of C&IT might have yielded other results.

Discussion

Attending a wired campus seems to have positive though trivial in magnitude benefits on engagement in good educational practices. Although the use of computing and information technology for word processing and e-mail is practically universal, students attending a wired campus use these forms of technology even more than their counterparts elsewhere. In the case of e-mail this was also true for older students.

Kuh and Hu (in press) found that C&IT use was associated in complex, statistically significant ways with the overall amount of effort students devote to educationally purposeful college activities. Academic effort combined with C&IT use in turn yielded greater gains in certain areas (e.g., science and technology, vocational preparation, and intellectual development). Taken together, the findings of Kuh and Hu (in press) and this study confirm the popular view that C&IT use is positively related to college student learning and personal development. Equally important, the pervasive presence of C&IT at more wired campuses as determined in the present study did not have any negative effects, but ranged from benign to slightly positive on the outcome variables of interest. Even so, additional research is needed to determine the extent to which C&IT is being used for purposes that may be incompatible with the educational missions of postsecondary institutions, such as surfing the web, playing games, or for personal use (e.g., communicating with family, friends, and employers).

Several studies suggest that use of C&IT may differ depending on student background characteristics (Kuh & Hu, 2001; Pew Internet and American Life, 2000). For instance, Kuh and Hu (in press) found that overall men more frequently used C&IT compared with women. But in terms of different types of C&IT use, women favored word processing and e-mail, with men more frequently using visual displays, data analysis, and multimedia presentation options. The findings in this study indicated the degree of campus wiredness benefited both women and men comparably with regard to their computing experiences and exposure to good educational practices. The only major difference related to student background characteristics was that non-traditional students seem to benefit less from campus wiredness than traditional students, with the single exception of e-mail use. Though some have argued that computing and information technology may be less accessible to students of color compared with White students (Malveaux, 2000), this was not the case in our previous study of C&IT use (Kuh & Hu, 2001). This may be because accessibility to C&IT is less of a problem once students are in college. Additional research into these and related questions would be welcome.

We did not conduct any kind of cost-benefit analysis in assessing the merits of C&IT on student engagement in good educational practices or the frequency and satisfaction with the availability or use of the technology. The differences favoring students at the more wired campuses were generally so small so as to not be practically significant. Perhaps a careful examination of the investments made by more wired campuses in technology and additional measures of student learning outcomes would suggest that some of this money might be better spent on other types of resources (e.g., additional faculty members) if it can be demonstrated that other types of educational experiences yield greater benefits. But it is also possible that more precise estimates of campus wiredness would discover more sizeable differences in the magnitude of the relationships between C&IT and educationally purposeful student experiences. That is, this study divided institutions into only two groups (more wired, less wired). Should the rankings of wiredness become more stable, it would be prudent to determine if the strength of the relationships between C&IT and student experiences increases.

Conclusion

Computer and information technology represents a substantial investment of university resources that fortunately seems to be generally beneficial for virtually all types of students. The results of this study show that the degree of campus wiredness was positively associated with student use of computer and information technology, although the effect sizes were generally small in magnitude. The evidence also suggests that campus wiredness did not reduce student engagement in good practices such as student-faculty contact, cooperation among students, and active learning. In fact, students at more wired schools actually reported more contact with their teachers and more substantive interaction with their peers. In addition, there was no gender difference in the relationship between the degree of campus wiredness and student computing experience and engagement in good practices. That said, older, non-traditional students did not seem to benefit as much as their younger counterparts.

On balance, it appears that the presence of computing and information technology, even on campuses where it is especially prevalent, does not hinder the educational process. Additional research is needed to corroborate these findings and to better understand the effects of technology use on student learning and personal development.

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Appendix

CSEQ Items That Represent Good Practice in Undergraduate Education

Student-Faculty Contact

(The alpha coefficient for computing experience is 0.82, and the item intercorrelations range from 0.03 to 0.58.)

- Asked a librarian or staff member for help in finding information on some topic.
- Asked your instructor for information related to a course you were taking (grades, make-up work, assignments, etc.).
- Discussed your academic program or course selection with a faculty member.
- Discussed ideas for a term paper or other class project with a faculty member.
- Discussed your career plans and ambitions with a faculty member.
- Socialized with a faculty member outside the classroom (had a snack or soft drink, etc.)
- Participated with other students in a discussion with one or more faculty members outside of class.
- Worked with a faculty member on a research project.
- Used e-mail to communicate with an instructor or other students.
- Met with a faculty member or staff advisor to discuss the activities of a group or organization.
- Talked with a faculty member, counselor or other staff member about personal concerns.

Cooperation Among Students

(The alpha coefficient for computing experience is 0.70, and the item intercorrelations range from 0.03 to 0.61.)

- Worked on a class assignment, project, or presentation with other students.
- Tried to explain material from a course to someone else (another student, friend, co-worker, family member).
- Met other students at some campus location (campus center, etc.) for a discussion.
- Played a team sport (intramural, club, intercollegiate).
- Worked on a campus committee, student organization, or project (publications, student government, special event, etc.).
- Worked on an off-campus committee, organization, or project (civic, group, church group, community event, etc.).
- Managed or provided leadership for a club or organization, on or off the campus.
- Discussed with another student, friend, or family member why some people get along smoothly, and others do not.
- Asked a friend for help with a personal problem.

Active Learning

(The alpha coefficient for computing experience is 0.82, and the item intercorrelations range from 0.01 to 0.49.)

- Gone back to read a basic reference or document that other authors had referred to.
- Made a judgment about the quality of information obtained from the library, World Wide Web, or other sources.
- Participated in class discussions using an electronic medium (e-mail, list-serve, chat group, etc.).
- Took detailed notes during class.
- Contributed to class discussions.
- Developed a role-play, case study, or simulation for a class.
- Tried to see how different facts and ideas fit together.
- Summarized major points and information from your class notes or readings.
- Applied material learned in a class to other areas (your job or internship, other courses, relationships with friends, family, co-workers, etc.).
- Used information or experience from other areas of your life (job, internship, interactions with others) in class discussions or assignments.
- Worked on a paper or project where you had to integrate ideas from various sources.
- Used a dictionary or thesaurus to look up the proper meaning of words.
- Used a campus learning lab or center to improve study or academic skills (reading, writing, etc.).
- Read articles or books about personal growth, self-improvement, or social development.
- Read articles about scientific or mathematical theories or concepts in addition to those assigned for a class.
- Identified with a character in a book, movie, or television show and wondered what you might have done under similar circumstances.
- Taken a test to measure your abilities, interests, or attitudes.

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Education Policy Analysis Archives

Volume 9 Number 50

November 30, 2001

ISSN 1068-2341

A peer-reviewed scholarly journal

Editor: Gene V Glass

College of Education

Arizona State University

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Articles appearing in EPAA are abstracted in the *Current Index to Journals in Education* by the ERIC Clearinghouse on Assessment and Evaluation and are permanently archived in *Resources in Education*.

School Choice Policies in the Political Spectacle¹

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Citation: Miller-Kahn, L. & Smith, M.L. (2001, November 30). School choice policies in the political spectacle, *Education Policy Analysis Archives*, 9(50). Retrieved [date] from <http://epaa.asu.edu/epaa/v9n50.html>.

Abstract

This article presents research on school choice. It takes the case of a school district in Boulder, Colorado, through the decade of the 1990s and shows how interest groups took advantage of federal, state, and district policies meant to promote school choice and molded them into a system of schools that met individualistic interests rather than the common good. Extensive interviewing and analysis of documents and media reports served as sources of evidence. The authors argue that district officials accommodated the demands of elite groups of parents to transform the district. The study is framed by revisionist theories of policy, particularly Murray Edelman's theory of political spectacle wherein real values are allocated to a few groups, the allocation occurring largely out of public scrutiny. For most of the public, however, policies are largely symbolic.

When George W. Bush took office in 2001, he proposed legislation that would require all students in grades three through twelve to take a national test. A student's scores would determine whether he or she could pass to the next grade or stay in the same grade for another year. Scores would also determine whether high school students could graduate. Moreover, the average test score of a school's students would be used to determine whether the school itself was improving. Schools that failed to improve would be held accountable to "market forces." Parents of children in failing schools would be given a sum of money (\$1500 is the amount usually mentioned) to spend on tuition at schools of their choice, whether public or private, sectarian or not, other than the neighborhood school that their children would normally attend. In theory this plan would be good for everyone, because parents could opt out of schools that were failing and go to the schools of their choice. Faced with the threat that families might leave, administrators of neighborhood schools would have to take steps to improve. Those that did not respond to these market forces would eventually find the school doors closed permanently, the parents exiting with their \$1500 to spend elsewhere.

To Bush advisors, it was important that the press refer to this policy as "school choice." To his critics, it was important to call it "school vouchers." Language matters. Choice sounds like a good thing. Choice sounds American. If we can choose a Hoover upright canister from the array of vacuum cleaners on the market, why shouldn't we be able to choose the schools that satisfy our individual preferences and needs?²

As a policy, school choice has a history, a theory, a community of belief, research, and politics. Milton Friedman, noted economist and advocate for the free market and its application to all aspects of political and social

life, introduced the concept of choice as a remedy for underachieving schools. He reasoned that public schools were ineffective because they belonged to the State. As creatures of government they became bureaucratic, entrenched, and unresponsive to parents. Overall, they were inefficient, especially compared to private and parochial schools, producing less achievement for greater cost. Like the U.S. economy of the 1970's public education underperformed and underachieved. Conditions were bad enough, he argued, that fundamental reform was only possible by injecting the discipline of market forces. Freed of obligation to send their children to neighborhood schools, parents would educate themselves about options and then select the ones that would best meet the needs of their own children. Public schools, forced to compete, would improve and diversify their programs. Parents with options would be more likely to participate in the education of their children. The key policy issue, however, was to divert public funds for private use. A pupil's state allocation should be given to parents to use as they saw fit. The invisible hand would move across the landscape of education and improve it for everyone. So thought Friedman, who created a large following among neo-liberals. Along with Friedrich Hayek, Friedman's work made a significant impact on Margaret Thatcher, British Prime Minister, and spread to many parts of the world. *A Nation at Risk*, the report released by the Reagan administration (National Commission on Education, 1983), mentioned market choices as a response to the crisis in public schools.

School choice (as we will call it here) gained adherents in several categories (e.g., Apple, 2001). Together, these groups bought choice policies space in the national discourse about schools:

- Political conservatives viewed choice policies in light of their general distrust of and antipathy toward all government institutions. Since they believed that the size and power of government should be constrained, they also slanted their discourse, calling public schools "government schools," monopoly schools, or even "socialist schools." They likened the privatizing of education to the fall of the Berlin Wall and the collapse of the soviet states.
- Religious conservatives viewed school choice policies as ways of escaping the wickedness—sex education, secular humanism, assault on family rights and values, absence of school prayer, and promotion of homosexual and other nontraditional life styles, even satanism—that to them was evident in public schools.
- Cultural restorationists (or neoconservatives) such as E.D. Hirsch (whose Core Knowledge curriculum package played a role in the Boulder case), William Bennett (speaking on behalf of the Reagan and Bush administrations) and others viewed choice policies as a way out of the quagmire they believed progressive "educationists" and "educrats" had made of public schools. Advocates of home schooling and traditional pedagogy made common cause with them.
- Existing parochial schools, in light of declining enrollments, identified choice policy as a way for their institutions to survive.
- Activist parents in some predominantly non-white urban neighborhoods, having lost faith in the schools their children attended, identified choice as a way to escape those schools. Groups such as the Black Alliance for Educational Options in Milwaukee often received funding from foundations such as the Friedman and Walton Foundations to press their case.³
- Entrepreneurs and corporations that desire to construct private schools for profit as well as those that want to market products and services to public, choice, and private schools alike.

Although the aims of these groups sometimes diverged, they forged an effective coalition to provide political support, funding, and discourse in favor of various policy instruments under the school choice umbrella. A number of conservative think tanks provided strong communication networks for these groups to pool their ideas and resources. The same networks funded research, which resulted in studies that seemed to provide an intellectual justification for choice.

The choice coalition favored vouchers as the most effective instrument of school choice and the closest to the free-market ideal. However, it also pushed for several "second best" alternative policy instruments including charter schools, magnet schools within districts, tuition tax credits, inter-district and intra-district transfer policies, as well as incentives for education corporations that arose from the private sector. As states turned down legislation and referenda on voucher programs, advocates pursued these other alternatives. Even outside the choice coalition, some people who believed that vouchers would undermine public schools also advocated charters as a way to avoid them.

But is school choice, particularly embodied by charter schools, a rational means to save public schools? Will charters make the school system more effective? Or will charter schools simply open the way to more extreme forms of privatizing them? Is there any way of knowing whether any such contradictory claims could be answered at all?

In this article, we present a case of school choice policy. We consider policies in general through the theory of political spectacle, which contrasts radically from conventional notions about policy and politics. Anne Schneider and Helen Ingram's (1997, pp. 3-4) definition of politics fits our sense of deep contradictions:

The term "politics" is associated in the popular vernacular with the strategic manipulation of power to serve personal or narrow special interests at the expense of more legitimate concerns. This construction has eclipsed the classic understanding of politics as the means through which collectivities make decisions to serve the general (public) interests of the entire society.

Most people and many scholars define policy as the authoritative and rational allocation of values. That is, policies arise as sensible responses to public needs. A consensus about the common public good develops out of citizen and political debate; administrative authorities develop regulations, instruments, and programs that are likely to meet those needs. These means are enacted and the public learns about the relationship of means to ends—how well the instruments and programs meet the needs and goals of the policy. The conventional view conceives of the policy process as relatively linear and straightforward. Politics, the struggle for relative power among constituent groups, is in the background. Deborah Stone called this "the rationality project." To counter the conventional, rational

view of policy, Stone argues that a conception of policy with politics in the foreground provides a better fit with the experience of history. As an alternative to the rationality project she offers the study of policy within the "polis," or political community. The model for studying policy should "account for the possibilities of changing one's objectives, of pursuing contradictory objectives simultaneously, of winning by appearing to lose and turning loss into an appearance of victory, and ... of attaining objectives by portraying oneself as having attained them" (Stone, 1997, p. 9).

She goes on to argue that the production model in the rationality project "fails to capture what I see as the essence of policy making in political communities: the struggle over ideas. Ideas are a medium of exchange and a mode of influence even more powerful than money and votes and guns" (Stone, 1997, p. 11).

The case we present here can be understood as a case of political spectacle. Political spectacle theory holds that contemporary politics resembles theater, with directors, stages, casts of actors, narrative plots, and (most importantly) a curtain that separates the action onstage—what the audience has access to—from the backstage—where the real "allocation of values" takes place.

Murray Edelman describes it thus:

[There] is a distinction between politics as a spectator sport and political activity as utilized by organized groups to get quite tangible benefits for themselves. For most men most of the time politics is a series of pictures in the mind, placed there by television news, magazines, and discussions. The pictures create a moving panorama taking place in a world the public never quite touches (Edelman 1985, p. 5).

Edelman identifies seven elements of the theory: symbolic language; casting political actors as leaders, allies, and enemies; dramaturgy (staging, plotting and costuming); the illusion of rationality; the illusion of democratic participation, disconnection between means and ends; distinguishing action on stage versus action backstage.

Symbolic Language

Language is at the heart of political spectacle, and language is always ambiguous. In political campaigns, the use of such words as patriotism, democracy, and compassion is metaphorical. So is the use of such words as "accountability," "high standards," "freedom of choice", and the like in conversations about school policy. Concrete referents to these abstract words are lacking, so that no tether exists to tie them to the world of experience and intractable, concrete details. Or rather, there are so many different mental pictures that form in the minds of the public when these words are spoken that one can scarcely pin down the specific meaning of the person who spoke them. According to Edelman, "[D]ictionary meanings are operationally close to irrelevant" when words are used for political purposes" (Edelman 1985, p. 139).

Such linguistic ambiguity creates a kind of fog. It holds the public in a thrall. Politicians use ambiguous language to unite a public and create an impression of consensus that does not exist. For example, "accountability" suggests something quite different to accountants, to educators, and to testing experts. When teachers hear the word, they might be imagining professional and moral responsibility for the welfare of their students. In the corporate world, people might imagine something different, a mechanism for tightening controls over teachers' actions.

Ambiguous, multivalent meanings create anxiety in the public when politicians use words to evoke crisis. The paradigm case of using lurid language in educational policy is *The Nation At Risk*. Its author claimed that the decline in educational achievement was so drastic that had a foreign power done to our country what our schools have done it would be considered an act of war:

[T]he educational foundations of our society are presently being eroded by a rising tide of mediocrity that threatens our very future as a Nation and a people. (National Commission on Education, 1983, p. 1)

This use of graphic, metaphorical language made a connection in people's minds between academic achievement and national defense and between achievement and economic competitiveness. Such language evokes images of a depleted, diseased, and failed public school system, and one that endangers U.S. economic health and even its security. These images have been engrained in the background assumptions the public hold, evidence to the contrary notwithstanding. The metaphors used in political spectacle have long since lost any concrete referents they might have had. Whether or not the crisis in *A Nation at Risk* and subsequent reports is realistic, it serves the political spectacle in two ways. First, it serves as a pretext for radical actions offered by policy makers to correct the alleged problem, and secondly, it arouses emotional rather than critical responses in the public.

Political language is banal (the public has heard the words so often) and ritualistic. Political language is strategic (officials use it to advance a political goal). Political language generates emotional responses rather than critical responses or concrete actions. Political language bemuses, obfuscates, befogs, mystifies, lulls, glosses.

Casting Political Actors as Leaders, Enemies and Allies and Plotting Their Actions.

In the second element of political spectacle, characters are cast to play certain roles. The constituent groups construct and then take on roles such as leader, ally and enemy. The public generally believes that such roles are natural and inevitable and fails to recognize them as social constructions. The public believes that leadership is a trait that people have more or less of, based on their genetic endowment or early upbringing. This is the cult of personality.

A belief that better fits political spectacle theory is that leadership is a role that certain individuals take on and shape themselves to fit. Politicians in the policy arena take advantage of the common ideology that some people are born leaders and thus are different from the rest of us, according to Edelman. Persons who would be seen as leaders reinforce images of themselves as leaders by acting in formal, public settings, as leaders are supposed to act, that is "through a dramaturgical performance emphasizing the traits popularly associated with leadership: forcefulness, responsibility, courage, decency, and so on" (Edelman 1985, p. 81).

The defining of policy actors as leaders functions to insure quiescence and justify unequal privileges and authority. In the political spectacle leaders identify crises and must launch programs that can produce dramatic outcomes in a short period of time. The public seldom has the chance to judge a program by its long-range benefits and burdens. Because the leader accentuates the dramatic response, the success or failure of the acts of the leader can seldom be traced. Often, the leaders are long-gone before the effects become clear, if they ever do.

Likewise, leaders create enemies and stage battles for dramaturgical effects. Media reinforce the aspects of spectacle rather than substance. According to Edelman, "Because politics involves conflict about material advantages, status, and moral issues, some people are always pitted against others and see them as adversaries or as enemies... They help give the political spectacle its power to arouse passions, fears, and hopes..." Leaders have much to gain by exaggerating the threat the enemy poses and by distorting the facts of the enemy's record. The leader has much to gain by discounting the arguments of enemies and portraying them as irrational and ideological (while the leader is rational and fair-minded)" (Edelman 1988, p. 66, p. 73).

Stone states that "Symbolic devices are especially persuasive and emotionally compelling because their story line is hidden and their sheer poetry is often stunning.... The most important feature of all symbols, both in art and politics, is their ambiguity [because a] symbol can mean two (or more) things simultaneously.... Ambiguity enables the transformation of individual intentions and actions into collective results and purposes.... [A]mbiguity allows leaders to aggregate support from different quarters for a single policy.... [A]mbiguity allows leaders of interest groups and political movements to bring together people with wishes for different policies...." (Stone, 1997, pp. 152-158).

Dramaturgy: Political Stages, Props, and Costumes

According to Edelman, political acts take place in contexts that suggest that a few individuals are actors and most are spectators. These formal settings reinforce and justify the social distance between the two groups and legitimize "a series of future acts (whose content is still unknown) and thereby maximizing the chance of acquiescence" (Edelman, 1985, p. 98). Policies announced from in front of the presidential seal, rules handed down from a Federal Court bench or from other formal or evocative settings have this function. ⁴

Democratic Participation as Illusion⁵

The conventional model of the policy process conceives that the public, once informed of the objective facts about the details of a policy, will be in better position to participate in the policy process. They can deliberate in a more informed way. But Edelman argues that "the public is constantly reminded that its role is minor, largely passive, and at most reactive. The intense publicity given to voting and elections is itself a potent signal of the essential powerlessness of political spectators.... an individual vote is more nearly a form of self-expression and of legitimation than of influence and that the link between elections and value allocations is tenuous" (Edelman, 1988, p. 97).

In the political spectacle, leaders act. Others react. Most people believe they participate in democracy by voting or at most by testifying at hearings where policies are under consideration. According to Edelman, however, in politicized policy making the actions of the public amount to mere rituals—highly formalized and far removed from where the real decisions are made. The broad visions and fine details of policies are worked out backstage.

Realizing that participation is a formality creates a self-fulfilling prophecy. If a person believes she lacks control over government and policy making, she then takes less active interest in it and rarely takes action in relation to it. Passivity and cynical or resigned detachment exacerbate political spectacle.

The widespread use of opinion polls has largely displaced authentic participation in policy decisions and the allocation of educational values. Indeed, political actors look to the results of polls to formulate a set of symbolic gestures. For example, politicians often point to the results of polls that show the majority of the public favors "ending social promotion." The findings of polls thus provide a justification for such policies.

Politicians also use polling results to indicate what kinds of symbols best promote themselves. They then adopt hair styles, hand gestures, and slogans that the polls show would be popular.⁶ Susan Herbst (1993, p. 50), in her book *Numbered Voices*, emphasized the hypocritical use of polling results: "Machiavelli believed that if a ruler was to gain control over the populace, he must seem humane to the masses regardless of his true feelings for them.... Superficial appearances matter most of all." ⁷

Polls distance the public from authentic political action. Over time, as the extent of polling increased, public cynicism toward government has also increased, along with general political alienation. "[R]esponding to polls is a reactive form of political expression.... Because of its routinized procedures [polling] does not demand the same level of emotional (and physical) intensity as does [sic] striking, demonstrating, door-to-door canvassing or attending meetings." (Herbst, 1993, p. 153) ⁸

Since the questioning takes place privately and anonymously, a person can answer without fear of being held accountable for consistency over time or among issues. The respondent may speak without having any information or thoughtful reflection and conversation about the topic. Since polling takes place privately, citizens lack the chance to discuss issues with others, thereby having the chance to learn more about the issues and perhaps modify them. Private polling tends to atomize the public, isolating them from one another and therefore disempowering them. It tends to diminish the kinds of grass roots collective action that requires social interaction among people.

Illusion of Rationality

In the rationality project, policy analysts would like to think that their concepts are above politics, but this is not possible. Instead, policy analysis is "itself a creature of politics; it is strategically crafted argument, designed to create ambiguities and paradoxes and to resolve them in a particular direction" (Stone, 1997, p.7). Edelman adds, "any political analysis that encourages belief in a secure, rational, and cooperative world fails the test of conformity to experience and to the record of history" (Edelman, 1988, p. 4).

According to Edelman, "complete rationality in decision-making is never possible... because knowledge of consequences of any course of action is always fragmentary, because future values cannot be anticipated perfectly, and because only a few of the possible alternative courses of action ever come to mind" (Edelman, 1988, p. 68). In political acts, actors evoke symbols of rationality. They point to the results of public polls, census statistics, or declining test scores to justify actions they want to take on political grounds.⁹

Although rationality is an illusion, the public must believe in the rational and ethical underpinning of the action or else it will fail the test of credibility and authority. Thus do policy researchers become political actors or pawns of politicians by producing studies and statistics that appear objective and rational.

In the rationality project, people are believed to be rational actors who make reasoned choices. But Stone points out that in the political world, actions come about for emotional reasons. Social reasons may govern who cooperates with and who fights with whom. Building coalitions, taking sides, and negotiating deals replace or stand equal to reason in explaining actions in the political spectacle.

Disconnection of Means and Ends

One can distinguish instrumental from symbolic policies by judging whether their goals have credible relationship to the means provided or suggested to achieve them. Is there a technology or research base that connects programs to desired outcomes? Are teachers equipped to deliver the programs? Have enough time and material resources been provided to develop and implement them? Is there any provision for monitoring implementation or assessing effects? If not, one suspects a primarily symbolic policy. Symbolic policies reinforce the leadership image of those that proposed them and instill quiescence among others—a dulling of critical response. Calling for a reduction in class size positions the political actor as a friend of education and defender of high achievement standards. The public is lulled into acquiescence: something seems to be done to address the problem that worried them. People in such a state are unlikely to ask about the potential side effects on teacher supply and classroom availability (or what children are most likely to be taught by uncertified teachers as a result) (e.g., Fetter, 1994). The high costs of the program may make implementation prohibitive. The leader symbolically benefits while material benefits for children will be unequally distributed and largely out of sight—or entirely absent.

Even the notion of means and ends assumes rationality in politics that is seldom present. Problems and courses of action (policy goals and policy instruments) are themselves social constructions. That is, some political actors view poverty as a problem to be solved, others as an inevitable part of the natural order and thus beyond the means of policy to remedy.

According to Edelman, "The language that constructs a problem and provides an origin for it is also a rationale for vesting authority in people who claim some kind of competence. Willingness to suspend one's own critical judgment in favor of someone regarded as able to cope creates authority.... People with credentials accordingly have a vested interest in specific problems and in specific origins for them" (Edelman, 1988, pp. 20-21). "A 'policy' then, is a set of shifting, diverse, and contradictory responses to a spectrum of political interests" (Edelman, 1988, p. 25).

But symbolic policies still have effects, though they are not necessarily related to the problem they were set to solve.

The construction of problems sometimes carries with it a more far reaching perverse effects: it helps perpetuate or intensify the conditions that are defined as the problem, an outcome that typically stems from efforts to cope with a condition by changing the consciousness or the behavior of individuals while preserving the institutions that generate consciousness and behavior.... Imprisonment may help perpetuate crime by exposing prisoners to knowledgeable criminals who teach them techniques. It also eventually releases most prisoners into a society from which they have become even more estranged than they were before their imprisonment and in which they lack resources to cope in any way other than renewed resort to crime. (Edelman, 1988, p. 68)

Distinction Between Onstage Action and Backstage Action

The conventional view of policy asks the key question: who reaps the benefits and who bears the burdens and costs of a policy? The traditional view defines policy as the authoritative allocation of values. Of an educational policy one ought to ask how it affects the resources and opportunities of students, educators, and the public as a whole; how it spreads the risks and cushions the blows that sometimes attend to policies and programs.

In the political spectacle there is a sharp distinction between those values allocated to the general public and those values that are allocated to a favored few. Edelman believes that only a few members of society reap real benefits. These benefits include material profits—dollars and cents, contracts and tax abatements. But they also encompass opportunities for political office and administrative posts, such as ambassadorships. In addition, we would include real benefits to the status or public relations image of a person or organization (which then can be parlayed into material benefits). Finally we include benefits to special interest groups with particular ideologies and contacts with the politician. Benefits such as these are negotiated behind the scene and out of sight.

Political spectacle theory such as Edelman's and revisionists theories such as Stone's challenge our perspectives

on school policy. In the following case history we record not only the radical changes in one district experienced in a single decade and more importantly, the process by which the changes were made. No conventional theory of policy change explains it. Each element of political spectacle theory shapes the changes that occurred.

School Choice in the Perfect Town¹⁰

Boulder, Colorado, ought to have been the last place where unhappy parents should seek escape from the public schools. In 1989, Boulder Valley School District could boast that it had responded to the full program of progressivism. Scores on achievement tests were high, as one would expect from the district's demographic profile. Up to that time, the public was generally satisfied with the quality of schools (or at least complaints were no more than what one would typically expect in suburban schools) and demonstrated this satisfaction by passing most bond issues the district proposed.

Typical students in the valley attended public schools in their neighborhoods. Two small, expensive and elite private schools, one parochial school, and a residential school for problem students drew only a tiny percentage of eligible students away. The town of Boulder proper had long ago reached icon status, a desirable place to live, a place of natural beauty and liberal politics. Years of focusing on the preservation of its environment and quality of life had led city councils to adopt open space ordinances and control growth.

Demographic trends, including in-migration from the west coast and ordinances to control growth inside the city, infused new money and contributed to vast expansion outside of the city in surrounding communities east of Boulder, filling existing schools and pressuring the district to build new ones. Housing costs skyrocketed inside the city limits. Young, middle class families soon found the costs too high, so that, as the children in city schools grew up, no new children took their desks. City schools soon found themselves short of students and at risk of being closed. Increasingly, students from one neighborhood were bused to another. It sometimes seemed that kids from the mobile home parks or low-income housing were most often the ones on buses. In the schools with the most affluent parents, the periodic threats of closure were successfully fought off even when many of its chairs remained empty.

Deep currents of social change began to threaten the apparent consensus on education. The small university town of the 1950s and 60s and the laid back liberal sanctuary of the 1970s and 80s had begun to give way to a much more affluent and conservative population, people with different ideas and expectations for the education of their children. Conspicuous consumption altered the previously egalitarian social landscape. The school district, however, did not yet feel this local social current as it occupied itself with implementing a complete package of progressive reforms.

Progressive School Restructuring

In keeping with its progressive policies and in response to nationwide restructuring efforts in public education, the Boulder Valley School District (BVSD) adapted a middle school philosophy in 1989. The middle school restructuring, to be phased in by fall 1992, followed the report of the Carnegie Commission entitled *Turning Points*. That policy document recommended that schools for young adolescents be reorganized so that students from sixth through eighth grade could be placed, not in homogeneous ability groups but mixed with students of all types and levels of prior achievement. Instruction should be delivered in blocks, so students could spend longer periods of time with teachers who covered multi-curricular areas. The centerpiece of the philosophy was its focus on practices appropriate to the developmental needs and characteristics of young adolescents. The resulting programs would feature thematic and integrated instruction that followed student interests. In the plan for district restructuring, the aim would be to make schools more effective for all students. Most teachers and parents who participated in restructuring plans called this "the middle school philosophy." Conflict over the middle school philosophy would soon erupt into broad institutional changes over the next decade in Boulder.

In January of 1990, the district hired Dean Damon,¹¹ a known innovator and progressive educator, as superintendent. Damon set up School Improvement Teams (SIT), the Institute for Development of Educational Activities schools (IDEA), and Site Based Management (SBM). All of this alphabet soup of restructuring consisted of teachers, parents and administrators at schools throughout the district. They met regularly to envision a new direction for education with a focus on site-based decision-making and progressive reforms. By that time the district had a full staff of specialists on various aspects of progressive curriculum and a thoroughgoing program of professional development for teachers. Things seemed to be going well and going in a particular direction.

Choice Options Introduced by the District

The initial school choice options that the district launched matched its vision for progressive education. For nonconformist students the district had already opened, in 1988, an alternative school based on William Glasser's philosophy of reality therapy and integrated pedagogy. For its patrons who favored a wholistic and student-centered program, the district opened an elementary school in 1991. For parents wishing bilingual education for their children, the district opened an elementary school in that same year, where Spanish-speaking children would learn English (and English-speaking children could learn Spanish) along with their academic subjects. Each of these schools operated as a magnet school that any parent in the district could select over their neighborhood schools. And in each instance, designing, planning, and implementing were conducted by professionals in concert with the parent groups, with rich contributions from the experts in curriculum and pedagogy from the district office.

First Sounds of Discontent

Those initial forays into choice by the local district ignored or contradicted the discourse about schools at the national level, exemplified by *A Nation at Risk*. Whatever the condition of public schools elsewhere, Boulder schools were not in a state of crisis. The message of national school crisis was first brought to the Boulder consciousness by Janet Jones, a parent from the affluent southwest corner of Boulder. She believed—and a considerable number of other parents believed with her—that the district plans would de-emphasize rigorous academic preparation. She focused her attention especially on the plan for converting junior high schools to middle schools. She believed that this reorganization would reduce the already declining academic performance of Boulder schools, and, more especially, would end up detracting from her own children's education. She based her complaints on her analysis of district achievement test scores. Not receiving any attention or satisfaction from the district, she next took her statistics to the local newspaper, the *Boulder Daily Camera*, which not only published her analysis but also endorsed its findings and recommendations:

The excellence of Boulder Valley schools is widely taken for granted, but this analysis by a parent and informed critic suggests a deepening mediocrity. Her prescription: Take the system back from the education "experts" and restore a real commitment to academic excellence.

Media Creating Spectacle

If the *Camera* had taken a balanced position on the subject of school achievement it would have reanalyzed test scores to confirm or disconfirm Jones's interpretation. Or, newspaper staff might have interviewed internationally recognized experts in testing who worked at the university. It might at least have requested clarification and reinterpretation by the appropriate district officials. The *Camera*, however, did none of these things. Instead it accepted Jones's claim that achievement was declining in Boulder and even referred to her as an "informed critic." It punched up the message of discontent and crisis by printing a half-page cartoon depicting a student with a dunce cap in one hand and a mortarboard in the other. Although the *Camera* printed a variety of letters to the editor on both sides of this debate (more perhaps of the critical ones), a response from Superintendent Damon did not appear until a month later. When he did respond, Damon defended the district restructuring and the goal of improving education for all—for the common good. In his op-ed piece, he claimed Jones's analysis was wrong and showed that, by using the correct metric recommended by the test publisher, most of Boulder schools exceeded expectations and were high over all. In contrast with the torrid and emotional language of Jones and her group, Damon's language was measured, rational, and tepid—almost offhand.

Aware of the threat that lay behind Jones's analysis of Boulder school achievement, the district hired Lew Romagnano, associate professor from Metro State University, to analyze math achievement test scores from 1987-1995. His analysis showed that, contrary to the Jones conclusion, "the district's efforts to improve the mathematics education of its students have already begun to show positive results."

But you cannot un-ring a bell. By the time Professor Romagnano pointed out the fallacies of Jones's analysis, the picture of mediocrity she constructed had impressed itself on the public consciousness.

The Jones episode illustrates some principles of political spectacle theory and the role of media. First, a political agenda is usually launched by an actor who bases his or her message of crisis by reporting statistics more dramatic than technically accurate. The apparently scientific reports provide the illusion of rationality so necessary to policy makers. In this case, Jones intended for her analysis to provide the pretext for adoption of school choice policies as well as exclusive programs for the top students. Second, newspapers construct and reinforce a sense of crisis in policy matters. As noted above, the *Camera* could have checked to see if her analysis created or reflected a factual decline in district performance. Third, media reduce complex situations to simple sound bites and visual symbols, such as the mortarboard cartoon and the table of scores that Jones created. Fourth, media take strong perspectives on policy issues and craft news articles and select or solicit opinion pieces that reinforce those perspectives. It seems clear that Jones's opinion piece reflected a point of view that was held by the *Camera*. From 1991 to 1997, few articles and opinion pieces that the *Camera* published were favorable to district schools. Fifth, the perspective that local newspapers take is often consistent with corporate interests nationally rather than local concerns.¹² During these years the *Camera* took an anti-public school and pro-choice perspective that echoed the national discourse about the decline of schools. In addition, the newspaper seemed to align with the elite critics, irrespective of local evidence to the contrary. Paraphrasing David Berliner and Bruce Biddle, choice advocates and the local media had "manufactured a crisis" (Berliner and Biddle, 1995). Political spectacle thrives on a sense of crisis even when a fair reading of the local facts shows otherwise.

The Rise of the Local Elite

Scholars define "elites" in various ways. For example Harold Lasswell defined elites as the "influential" (Lasswell, 1965). Amy Stuart Wells and Irene Serna defined local elites as "those with a combination of economic, political, and cultural capital that is highly valued within their particular school community" (Wells and Serna, 1996, p. 94).

Many people who fall into these categories would object to their inclusion. But, as Edelman argued, it is essential in the political spectacle to appear to be both democratic and rational, even though one's true intentions and actions point toward private benefits backstage and out of sight. In the conflict that followed, critics of choice often used the word elite to refer to the programs that Parents and Schools (the group that formed to resist Superintendent Damon's progressive reforms) created. The elites, meanwhile, rejected the label and jeered its use. For example, when choice parents crowed about high test scores, choice critics attributed those scores to the privileged status of "elite" students. Angry choice parents countered:

This is misinformed at best, and a deliberate lie for the purposes of political attack Their [Adams parents'] xenophobia is the true elitism and prejudice."

No one active in his or her child's education, whether through Parents and Schools, a school committee, a booster club, or otherwise, needs to apologize for trying to "get what they want for their kid." Many of the interests of each of our children are not for everyone, but this fact should certainly not diminish our commitment. If the school district has a problem with that, so be it.

On the other hand, some members embraced this designation, as one can see from the following letters to the *Camera*:

The argument for denying the option for hard academics seems rooted in the notion that a sense of inferiority will be engendered in those students who do not avail themselves of the opportunity. The entire program thereby grovels for inferiority.... The above observation will draw charges of elitism. Yes, and the world is based on elitism, delineated by those who can and those who can't process and communicate information (Smith, 1995a, 3B).

Our goal should be singularly directed at assuring every BVSD kid the opportunity to end up at the upper end of the food chain (Smith, 1995a, 3B).

Radical egalitarianism has become the basis for a scorched earth policy when it comes to academic rigor. Something happened to public education a few decades ago, around the time that the federal government injected itself and social engineering into the process. A cannibal joined the family picnic and calmly began to eat the children. Perhaps in a couple of decades ... we will all conclude that certain things, like war and public education, are too important to be left to the experts and politicians (Smith, 1995b, 4C).

Credit Janet Jones for tapping into a reservoir of discontent among affluent parents, particularly about district plans to convert junior highs to middle schools and to eliminate tracking students by ability. Among the well-educated and affluent parents whom Jones enlisted was Nobel prize-winning chemist Tom Cech, a professor at the University of Colorado. Cech added his voice and prestige to Jones's group and recruited other well-educated, powerful parents, many from the scientific community. This core group called a meeting in March of 1992 to challenge Superintendent Damon and the board of education. Five hundred people, almost all critical of district programs, attended this meeting. The core group administered a questionnaire. The results of this poll showed that the majority in attendance favored academic rigor, doubted the middle school philosophy and claimed that the district was unresponsive to the concerns of parents. Thus the activists formed the group called Parents and Schools. Soon the group was making headlines. For example, a *Camera* headline read, "District is under siege: Organized Parents Posed to Change the School System." Local and national political and educational experts said that the group possessed the characteristics of a "powerful political movement."

Its message is broad. It uses both passionate rhetoric and quantitative research. Its leaders are well known and have captured community attention.

In April, Parents and Schools circulated a petition that reflected the themes of the March poll. It presented this petition, with over 3000 signatures, to the school board. The board, however, refused to back away from its plan for middle school restructuring. Undaunted by the board's decision, the activists continued organizing.

Parents and Schools aimed first to organize political action that would force the district to offer school choice. To this end the group began a campaign to recruit and expand its membership to others who were critical of schools. Indeed, the rhetoric of Parents and Schools was almost exclusively critical, even damning and derisive. With Jones as its leader, Parents and Schools put together an e-mail network. It regularly published a newsletter that disseminated reports and letters critical of the schools and promoting their slant on curriculum and school organization. Through this communication network members were encouraged to speak out to the district administration, school board members, teachers and the public about the lack of academic rigor in the school system. One Parents and Schools newsletter solicited "horror stories:"

Stories Sought: What is your favorite example of the lack of challenge to students in our schools?
Please send your 'horror story' to Parents and Schools.

A letter writing campaign was organized, and the *Camera* published dozens of letters critical of the district's plans. Parents and Schools enlarged its power through networking. Many members also participated on school governance groups and site-based teams. They used these groups as platforms to express their complaints about the district and recruit more parents. Through extensive media coverage, the group had convinced many that the public schools in Boulder were failing and that immediate action was necessary. One of its first action items was to pressure the district to institute an International Baccalaureate (IB) program at one of the high schools. The IB program would offer students a rigorous curriculum and an internationally recognized diploma. For Parents and Schools, this program was an antidote to what they saw as the watered-down district curriculum and just the thing to provide an edge for their children into the most desirable college. Always the group used the threat of voucher legislation and charter schools to push their agenda of academic rigor.

Finally realizing the heat of dissatisfaction but suspicious of its extent and distribution across the entire district, Superintendent Damon asked the League of Women Voters to solicit a broader range of views from the community as a whole. Meanwhile the district fulfilled its plan to open the middle schools by the fall of 1992. It assigned ninth graders (who previously would have been assigned to junior high) to high school and students in grades six through eight to middle schools. Among other consequences, the restructuring decreased elementary school enrollments by 15%—a decrease in enrollment that would later prove to be significant in arguments about school choice.

A comment from Superintendent Damon illustrates the district perspective at the time.

The whole issue of focus schools was begun in this community as a way of being responsive and at the same time, good stewards of resources, responsive to a community that increasingly sees value in choice in public education. They (the board) have done a number of things to try to accommodate the community's interest in choice. One of them is the open enrollment policy which has been liberalized incredibly in the last three years because of legislative interest as well.

Choice and Political Spectacle

So far this story reflects positively on the arguments in favor of school choice. Perhaps the "government" schools of Boulder were less than responsive to the demands of parents. But the story can also be told through the lens of political spectacle.

Parents and Schools adopted the rhetoric of national achievement crisis, even against the evidence of the local test scores. Edelman points out that policy makers and political actors often invoke crises — whether real or not — to justify actions on behalf of private rather than public values. In this case the parent group wanted schools to return to homogeneous ability grouping and the most advanced and accelerated academic courses. They wanted these options so that their children would receive the most advanced and accelerated curriculum and preparation in academic subjects that would pay off, they believed, in higher college entrance test scores and enhanced transcripts. Parents and Schools lobbied the district to initiate a weighted grade system so that students who took advanced classes could still attain perfect grade averages. Whether the consequence of their proposed policy changes disadvantaged anyone else's children was not their concern. They wanted to return to the way things were before the progressive restructuring. This was cultural restoration, writ small.

Was the reaction of the elite parents rational in its pursuit of individual interests? Probably. Would attaining private goods accrue to the common good, as market theorists claim? Would it not be more valuable for the society as a whole for the best students to attain the best and highest academic slots? Would it not be more efficient? In the political spectacle, one always must speculate about differences between on stage and backstage benefits of policy decisions. Parents and Schools regularly claimed that the common good would be served if the group attained its goals. After all, they reasoned, every parent would have the right to choose, so everyone would benefit. Based on their private words and actions, however, it seems clear that its members pursued private, individual goals through the manipulation of public policy and public institutions.

David Labaree argued that a retreat from broad public interests toward private ones is a feature of a society that is driven by the values of social mobility rather than democratic equality or even human capital. At a time when the number of people attaining any given level of educational credential (junior high graduation, high school diploma, junior college certificate, college graduation, and so on up the educational pyramid) is increasing, the market value of that credential goes down. The newly dominant perception in American society identifies education as a commodity that individuals can acquire and then use to exchange for better positions in the occupational or educational world. Furthermore, the credential race is a zero-sum game; one person only gains relative to another's loss. As more people gain a credential, the elite of society press for higher standards and more selectivity at the next level, because they want to preserve their existing standing in a hierarchical social order whose topmost places become ever more scarce as the population size increases (Labaree, 1997).

Labaree's argument implies that elite parents in Boulder were trying (whether intentionally or unconsciously) to position their children more favorably to compete for the best spots at the next educational level. A rigorous and exclusive academic experience at junior high might get their children into the honors track at Boulder High, which would position them to gain admission to a prestigious university, which could then lead to better law schools, and so on. But acquiring these commodities for their own children also had the consequence of denying them to other children. Pursuing credentials to the detriment of others, however, was not part of the discourse onstage.

Local and Non-Local Discourse on School Choice

By 1992, Parents and Schools had tapped into an abundant source of pro-choice discourse. Communication and consultation networks provided advice, canned arguments, and "research" that supported "solutions" to "crises" of school achievement—more educational options—different choices. It tapped into both national and local advocacy papers, for example, a report by Professor Richard Kraft of the University of Colorado. The Independence Institute, (a conservative think tank designed to do the political work of the Coors family) published and distributed the report, which recommended that Colorado adopt a choice policy. The purpose of the paper was to influence state legislators who were then considering various plans including vouchers. Citizen groups had brought forward several initiatives, and in spite of its conservative origins, this paper and many others galvanized support for choice across the political spectrum.

In November 1992, Colorado voters defeated a measure that would have provided school vouchers statewide. Heeding polling results, advocates for choice realized that sufficient support for vouchers was lacking, they instead concentrated on the next best alternative: Charter schools. Advocates showered legislators with papers and briefs put out by various foundations and think tanks. They pushed newspapers to promote the values of choice. They sponsored

a Charter School conference designed to win over enough legislators to pass the bill. Through their efforts, a long list of legislators in both houses sponsored the bill, which passed in 1993 with strong majorities.

Unlike charter school legislation in, for example, Arizona, Colorado's was not particularly permissive (or, as choice advocates usually describe it, "strong"). The law in fact placed charter schools within district governance. That is, private groups or individuals inside district boundaries could propose charters, but the local board would have to approve those proposals. A result of this devolved decision-making about charter schools created substantial variation among districts in both the number of charter schools they approved and the extent of oversight each district imposed.¹³

Suborning Participatory Democracy in Boulder

In his attempt to get a handle on the extent of the public's criticism of the progressive reforms underway, Damon asked for help from a respected outside agency, the League of Women Voters. The League attempted to address this request by hosting a conference to discuss the direction of public education and propose a new plan. They wanted democratic participation by all the community, every constituency. To accomplish this the League appointed parents and educators to a planning committee. After the initial planning sessions, however, Parents and Schools staged a protest, withdrew its members from both the planning committee and threatened to withdraw its members from the conference itself. In a letter to the League president, Parents and Schools stated that the proposal for the conference was the work of the superintendent and "smacks of the kind of manipulated, impotent "process" that has frustrated many parents and contributed mightily to the district's current plight."

Apparently, the League's efforts were too democratic for Parents and Schools, which then began planning a conference of its own. Despite its earlier withdrawal, when the League-sponsored conference finally commenced in February of 1993, Parents and Schools people turned out in force.

The conference agenda called for dividing into small groups, each with a separate issue to discuss in regard to the future of education in Boulder. One of those groups was "Choice Vision" whose assignment was to discuss the possibility of choice schools in the district. More than one third of the members of the group of 33 was affiliated with Parents and Schools, including Janet Jones and her husband. After the conference, a spin-off of the Choice Vision group was formed, made up of primarily Parents and Schools members. The stacking of the committee precluded open debate about both the pros and the cons of charter schools and other choice options. The self-selected composition of the subgroup co-opted the agenda and transformed itself into an advocacy committee. Thereafter, this subgroup was absorbed by Parents in Schools, but still retained the semblance of a League and district sponsored, fair-minded free-speech deliberation.

The spin-off Choice Vision Action group planned a second conference three months later that they called the Conference on Magnet Programs for BVSD. The district name was part of the conference title that made it appear to be district sponsored, but it was not. This time there was not even the semblance of district involvement that might have assured a broader perspective or any voice for the good of all. To symbolize its autonomy from the district, the group invited the superintendent to attend as just another conferee, like the parents or other invited guests. Because the Choice Vision Action group relied on Parents and Schools to publicize the Conference on Magnet Programs with its well-organized network of parent volunteers, the composition of the magnet school conference, its agenda, and guest speakers were all controlled by Parents and Schools. The mailing address for the conference was also the Parents and Schools mailing address, the home of Janet Jones. The group prepared summaries and full news releases for the media. Most of the names listed as further contact resources were Parents and Schools members. Two of those members were employees of the Colorado Department of Education. Another member sat on the Governor's Advisory Council for Math and Science. Nineteen days after the Conference on Magnet Schools was held in Boulder, Governor Roy Romer signed the Colorado Charter School Act of 1993.

Focus Schools in Boulder: Threats and Opportunities

The district was already changing. The hard work and diligence of Jones and Parents and Schools paid off when the district approved adoption of the International Baccalaureate program at Willowbrook High School. To Parents and Schools, "this is just the beginning."

In the summer of 1993, anticipating the effects of the new charter school legislation, Lydia Swize, Executive Director for Administrative Services for the district, assembled a group of parents and administrators. Their task was to design a process by which schools or private groups could apply for a new kind of school: a Focus School. Focus schools would function much as magnet schools (like those that operate in other parts of the country, primarily to desegregate urban districts). Like magnets, focus schools would draw students from throughout the district to schools with a specific curricular emphasis.

Both district administrators and choice advocates defined focus schools as alternatives to charter schools, but they imagined different kinds of functions. District employees imagined that focus schools would satisfy advocates of charter schools (the more extreme solution) as well as redistribute students to under-enrolled schools. Choice advocates, on the other hand, imagined that focus schools would be the thin edge that would eventually widen toward charters.¹⁴

The contrasts between charter and focus schools were ones of relative autonomy and application of market ideology. In the public arena choice advocates concentrated on those values. A charter school had to be approved by the district, and if approved, the district had to fund it. Once the money was assigned to the charter school, the district would have little control over day-to-day operation. A charter school could waive the district policies and contracts. In contrast, to establish a focus school in Boulder, the parties did not have to adhere to state oversight, and the application process was much simpler and more streamlined than what one had to do to apply for a charter. Once approved, the focus school would have to provide students with the district curriculum as well as any specialized

curriculum inherent in the focus application (e.g., Montessori or Core Knowledge). It would be funded by the district, would have to comply with district policies and the teacher contract. The budget of the two options differed as well. Funding for focus schools remained under the authority of the district. Students who joined charter schools, in contrast, took the amount of their expenditure with them. In retrospect, it is easy to see why the district favored focus schools.

Five administrators, three parents, and one teacher sat on the Process Design Committee for Focus Schools in late summer 1993. In addition to these members, Dr. Lydia Swize functioned as the group's facilitator. Although charter schools were intended to allow teachers and parents to design effective schools, the focus school committee had only one teacher member, the president of the Boulder Valley Education Association (BVEA). In any event, all three parents were active members of Parents and Schools—including Janet Jones. The group constructed a process that individuals would need to follow to design a focus school.

"Designing Our Dream School"

Looking back two years, while the political movement for choice developed to influence district governance, Parents and Schools served as a focal point for individuals disenchanted with their neighborhood schools for various personal reasons.

Jane Barillo disliked whole language and blamed this progressive approach for her daughter's inability to spell or write. When she asked her daughter's teacher to provide spelling instruction, she was told to buy her daughter a spell checker. Later, Jane's husband Jeff campaigned successfully for membership on the School Improvement Team in the hope of influencing school practices and found the staff intransigent on the question of basic skills versus whole language. The staff seemed to feel that instructional decisions should be made by trained professionals but Jane began to dwell on what she and her husband defined as absence of accountability—to her family—of the school, principal and teachers.

Jane's neighbor happened to be Janet Jones, the founder of Parents and Schools, who shared her analysis of test scores with Jane and Jeff. This seemed to confirm their growing belief that district schools were declining. Jones also gave them information about the emerging options of school choice in the district and state.

Jane ran into Maria, an old friend, while shopping for groceries. Maria had been frustrated by the district's failure to provide the services required for her gifted child. Maria had to fill in the void with academic activities at home. She had complaints about the music teacher. Since the school would not remove the teacher, Maria removed her daughter from music class and even showed up during music period to supervise her daughter. She campaigned to remove a principal she didn't think was effective.

Together the two friends discussed their frustrations and the declining test scores. They began meeting periodically to discuss what could be done. Jones put them in touch with Kay Harbruck whom Jones had pegged as a critic of the district, but in her case it was the vocational programs that she deemed a failure.

Dot Enwall was a well-respected teacher, having taught foreign language at the secondary level in BVSD for 14 years. For a frustrating year and a half she had worked as the foreign language coordinator for the district. She believed that teachers had too much autonomy and not enough accountability and that they jumped too quickly on any new fad that came their way. Now that her daughter neared school age, she began to pursue the idea of an alternative school. Janet Jones introduced her to Dot and Jane.

After much discussion, they decided to propose a focus school rather than go through the tedious work of applying for a charter. The group then turned to curriculum and teaching methodology. Although the four parents seemed sure of what they didn't want for their children, formulating a plan for what they did want was more difficult. Reasoning that the district would be more likely to respond favorably to a program with a national cachet, they fixed on Core Knowledge, a program that Parents and Schools targeted as promising. As the group studied the literature that Jones provided, Core Knowledge sounded promising. Their beliefs matched those of its creator, E. D. Hirsch, that there were facts that every student in America should know. The package that Hirsch sells focuses on basic skills. After the skills are mastered, the program takes them to ever higher levels of knowledge. The women began to think of themselves as the Core Knowledge group. With the help of Parents and Schools they arrived at a school name, Apex Elementary School. News of their plans spread through the affluent southwest corner of Boulder where they all lived.

In summer of 1994, district Executive Director Lydia Swize met with Apex founders and seemed satisfied with its proposal for Core Knowledge. Now came the question of where to put the school. Swize suggested that the founders hold meetings to gauge which schools might be interested in inviting Apex to share its facilities. Of course, the founders would have preferred their own building, but this did not seem to be a reasonable possibility. Swize named the buildings that were then or would soon be under capacity: Stonegate, Franklin, and Adams Elementary schools, all on the south side of town.

Capacity was a central issue in the district, which had to balance the demand for new schools in the east suburbs with the needs of each city school to survive. In the previous year, in fact, Swize had met with the staff of each school in the district that threatened to fall below the dreaded ratio of enrollment to number of seats. When she met with Stonegate staff and parents, she let them know that closure was a distinct possibility. To prevent that eventuality, Swize said, the staff and parents might consider the possibility of inviting a Focus School into its building. The school would operate as two different entities within a single school building. She hinted that a group of parents were in the process of designing such a focus school for south Boulder.

Versions differ about what happened at that meeting, whether Swize had merely hinted about or in fact had formally notified the staff and parents that the board had already pegged Stonegate as the primary contender to site Apex.

Apex founders held its initial meeting in August 1994, at Stonegate. The meeting was well attended. Although its stated purpose was to provide information about the proposed focus school, the Stonegate community believed it had been targeted. The defenses went up.

Stonegate staff and parents strongly opposed any action that would threaten the integrity of their school. They had explored, since Swize's meeting the previous spring, alternative means for increasing enrollment or otherwise warding off this, as they saw it, attack. By October, when the board announced that Stonegate was a likely choice for siting Apex, a full counter offensive was under way.

Stonegate's well-educated, affluent corps of active parents held neighborhood meetings, gave short speeches at school board meetings, wrote letters and phoned members of the school board and Superintendent Damon. They engineered a letter writing campaign to the *Camera* and distributed flyers and letters to all the homes in the neighborhood. In addition, a "Town Meeting" was held at Stonegate two days before the board was scheduled to consider the Apex and Montessori proposals for focus schools. When the board met on October 25 most of Stonegate's teachers and parents were there to press their case. Thirteen of them spoke, relating their concerns: that Stonegate had been left out of the planning phase of placement; that plans for placement had been rushed through; and that sharing the building would have a negative impact on both programs. They also brought with them a plan to turn their whole school into its own focus school, operating as a magnet for families throughout the district to choose. In contrast with the Apex focus, Stonegate Focus would retain its identity as a student-centered school with progressive curriculum and pedagogy. It would remain as a neighborhood but attract students from outside its boundaries to its progressive curriculum. More importantly from their point of view, this focus would be planned and implemented by teachers with parents rather than by parents alone, as was true of Apex.¹⁵

The board decided to find another place for Apex. It cited several reasons, but Stonegate's successful defense lay mainly in the economic and political clout of the families in the neighborhood who overwhelmingly supported Stonegate as it was.

With its new insights about allegiances between staff and parents of neighborhood schools, and without any guidelines to follow for siting focus schools, the school board turned its attention toward other schools with unfilled seats. Franklin Elementary, which was part of the less affluent part of south Boulder proved to be an inviting target. Enrollment at Franklin had been declining for years, but the board had kept it open to provide temporary housing for the overflow from the suburbs. Trying not to repeat the Stonegate mistakes, Swize convened meetings between the Apex planners and Franklin staff and parents (which were no less unhappy than Stonegate had been about the prospect of siting Apex there).¹⁶ By then the board was fully aware that, although few had ever raised objections to the idea of choice, the siting decisions were turning into political nightmares.

Finally a solution was proposed. The first two focus schools approved (Apex and Montessori) would be sited at an annex of Madison Elementary School. The annex would be empty the following fall. The Madison community had planned to add new language programs to be housed in the annex for its considerable population of children of foreign students at the university as well as a magnet bilingual education program for children bused in from the rest of the city. Last minute notification prevented the Madison community from pressing its case.

The board's next move foreshadowed problems to come. It appointed Claire Sauer as principal of both Apex in the Annex and of Adams Elementary School. The board reasoned in public that Adams would soon lose its bused children from the eastern suburbs to their new neighborhood school. As a result, Adams enrollment would then shrink by half. Clare Sauer could surely handle both assignments.

Following months of planning and staffing, Apex and Montessori focus schools opened their doors at the Madison annex. But everyone acknowledged that neither school could stay there for long. Both were filled to their capacity and already planning to expand, and the Annex had no more space. So the politically charged process of siting them more permanently began again. But this time, Apex had an advantage: a sympathetic principal it shared with Adams.

To the school board, siting Apex at the Adams building made sense. Nevertheless, it put off the political conflict until the election in November.

In September, a new east side school opened and 300 previously bused children who lived in its catchment area, along with their prized teachers and fund-raising parents, moved out of Adams. As eagerly as the Apex group looked to its future, Adams staff and neighborhood somberly contemplated its own. Sensing the inevitable course of policy, Clare Sauer, shared principal, suggested that the Adams School Improvement Team meet with the Apex group, as a friendly, welcoming gesture. The early meeting went well as the three parent leaders discovered what seemed to be similar goals for their children. There was no reason to believe that the two schools could not form a productive relationship.

Sometime before the November school board election, however, Adams parents had a change of heart. Principal Sauer hinted about the desire of Apex founders to maintain a "separate identity" from Adams. Ensuing phone conversations between representatives of the two schools confirmed the rumor that Apex parents did not want the two school populations to mix. To the Adams parents, the phrase "separate identity," was really a code for segregation of children from the two schools. Mutual wariness and suspicion clouded subsequent relations. With little time to spare before the school board made its final siting decision, Adams parents attempted to organize its opposition. They wrote letters to the school board, superintendent, and the *Camera* and held neighborhood meetings, but it was really too late. Unlike the parents at Stonegate, Adams parents possessed little ammunition—what some writers refer to as cultural capital—to effect the course of politics in the district and city.¹⁷

While the Apex founders pursued a "separate identity" from Adams, Parents and Schools directed its political activities toward the next election and the composition of the school board.

Colonizing the School Board

The school board election in November 1993 added two new faces and a shattered consensus on the board in regard to progressive restructuring. Although not among the founding members of Parents and Schools, Stephanie Hult and Kim Saporito were certainly sympathetic to its mission, always keeping "academic excellence" at the forefront of any debate. This was not the board majority they had hoped and campaigned for, but Parents and Schools finally placed some advocates there. As long as they were in the minority, they could not change policy. They could,

however, radically change the style of discourse in board meetings. And change it they did, and made civility a thing of the past.

In 1994, as the focus school drama played out, one school board member resigned, leaving room for an appointee to complete the term. Of the fourteen who applied, the board voted unanimously for Don Shonkweiler. It soon became clear that Shonkweiler's ideas about education were closer to those of Hult and Saporito than to the board's majority.

The diligence of Parents and Schools, meanwhile, began to pay off when an International Baccalaureate program opened at Willowbrook High. In addition, one high school opened as a focus school and a middle school applied for a charter. Parents and Schools viewed the IB program as having a "ripple effect" on the rest of the district. Right away, the group began to push for a pre-IB program in a middle school that would prepare students for the IB program.

Parents and Schools went to work in earnest as they planned for the 1995 election. Professing interests in equity, its candidates practiced stealth techniques, keeping much of their platform out of public view. In November, an incumbent and another candidate that Parents and Schools endorsed won the election and shifted the board majority. Within its first five weeks, the new board, which everyone referred to as the Hult board, approved seven applications for focus schools and one charter school. The placement of Apex at Adams was one of those decisions.

Relations between the board and founders of Parents and Schools changed drastically. The new board majority appropriated Parents and Schools goals for its own. Academic excellence, choice and fiscal responsibility were its top stated priorities. Then the board went to work on a different variety of restructuring.

The Hult board made no secret of their disdain for the past reforms (e.g., middle school restructuring, inclusion, heterogeneous grouping, collaborative, site-based decisions made by parents and teachers, and progressive pedagogy). Empowered by the "will of the voters," the school board immediately got to work on the agendas of the new majority, spending most of its time approving various focus schools, schools-within-schools, "strands" within schools, and wholesale adoption of basic skills curriculum for elementary schools. So much choice activity went on that the board finally had to declare a moratorium to catch its breath. And even after that, groups approached the board behind the scenes to press for additional choices, and in some cases, getting them.

But not everyone got to choose.

Within the administration building a new type of "restructuring" was occurring. Since the 1970's the district boardroom placed the board members and the superintendent at a long, slightly elevated table in front of a small auditorium. Soon after the election, Superintendent Damon's seat was lowered to spectator level. This gesture symbolized the Hult school board assumption of control over decisions that the "educrats" had formerly made. The Hult board established curriculum Councils meant to supersede the curriculum specialists. It appointed four teachers—all white, all male, and all experienced in high schools but not otherwise—to lead the Councils. Similar shuffling took place throughout the administration, with specialists in curriculum and professional development demoted, sent back to the classroom, or fired. The board ignored the protests of the teachers association. Its micromanagement of even the smallest details continued. Administrators with many years of experience in the district were fired or resigned.

It seemed as though no one was safe from Hult's caustic comments. Commenting on teachers, administrators and education professors:

It's the teachers' union and entrenched administrators and the school of education at CU that grind out this pap on education. Their number-one priority is to ensure the continuation of their own jobs. We come smack up against this bureaucracy of educrats. The teachers' union gets the teachers worked up, and they do the same with the students.

Despite the district's own evidence to the contrary, the Hult board kept beating the drum that Boulder schools were declining academically and needed more choice. Hult herself was fond of claiming publicly that charters and focus schools were antidotes to the threat of vouchers. Outside the public eye however, she was recorded at a meeting of the Independence Institute, saying:

I'm in favor of vouchers but don't let that leave this room because in Boulder that is really serious stuff.

By June 1996, the district had bought out superintendent Damon's contract and appointed Lydia Swize for a one-year term. Later that summer minority member Susan Marine resigned, stating her frustration with the Hult board's new direction. Dorothy Riddle, whose philosophy was closer to that of the Hult board majority, replaced Marine. In her formal resignation speech, Marine charged as follows:

Late this spring the board majority gave in to a small, vocal group of parents who demanded a new Core Knowledge site. We created even higher expectations for special-interest groups that do not want to work through the system and abide by established procedures.

Many of the problems I have with board conduct now occur in the back rooms at the Education Center and out of public view. Indeed, I am not directly informed when, for instance, some board member is trying to exercise control over hiring. If I am not gathering my own information, I may never know what is going on. Since matters like personnel are cloaked in executive privilege, the public remains largely ignorant of the way this board is operating.¹⁸

After leaving the board, Marine galvanized citizen opposition. Her work made progress. Although the effort failed to recall Hult, it nevertheless focused the work of board critics. The board, however, ignored its opponents and single-mindedly pursued its goals. More schools opened in the fall of 1996 with or as choice options (Apex opening at Adams was one).

The district mission statement was rewritten to echo the academic emphasis of the Hult Board. In March, the focus school moratorium was lifted officially, although it never stopped anything in fact. The Apex parents petitioned the board to expand further into the Adams building, thus displacing the neighborhood students. Adams offered a counterproposal, requesting its own plan for a Core Knowledge strand side-by-side with its progressive classes. The board approved the Apex proposal and rejected the proposal from the Adams parent-teacher group.

After a national search, the board hired Tom Siegel in June 1997. Siegel, a retired navy officer had no education background. Some observers claimed that the superintendent's lack of education background would make it easier for the board majority to continue to micromanage the district.

Public concern about the Hult school board majority continued to grow. Susan Marine, the minority board member who had resigned, formed the Coalition for Quality Schools to unseat the Hult board majority in the fall 1997 school board election. The campaign funds for the election reached mammoth levels. The political strategist hired by the Coalition focused campaign rhetoric on civil behavior for school board members.

Hult gave the critics plenty of ammunition. Shortly after she was elected, Hult created public furor when she made a negative comment to a Daily Camera reporter about the presence of a Downs Syndrome child in her daughter's English classroom. "I think those children are wonderful, but don't tell me it's a good mix." Parents of Special Education children took umbrage. They had fought many years for their kids to be educated in the mainstream. Although their effort to recall Hult failed, the group kept up its scrutiny of the board's actions.

However, for the Coalition to focus on civility took attention away from more substantive issues. The topic of school choice was absent from much of the campaign discussion. After unseating Hult, Saporito and Riddle in a landslide, the Coalition lost its edge and failed to scrutinize closely the tremendous changes and their consequences on district organization and curriculum.

Even as the Coalition celebrated its victory, Parents and Schools contemplated a future without three of "our four" school board members. That very night they began to plan for a new dream school, a stand-alone charter school for K-12, which founders hoped to operate without any district interference. They named the school Zenith because it represented the peak of their aspirations.

Even with a different philosophy, the new board could not undo the policies and directions of its predecessor. The new superintendent was ill-equipped to lead, and most of the former administrators and specialists had left the district. Moreover, most of the Hult board decisions were now part of the district structure. In a sense, it didn't matter so much that Parents and Schools did not have a compatible board. The group held enough power to communicate privately, enough power to operate almost completely out of sight of the public, enough power to control staff, curriculum and the selection of most of the students it wanted, enough power to conduct its financial affairs independently. With the opening of Zenith, all of its dreams had come true.

The new superintendent faced the persistent problem of excess capacity in the south and west parts of Boulder coupled with demands for new schools in the east. He floated again the necessity of closing schools. But when the public protested, he and the board withdrew their proposal and placed a moratorium on any school consolidation. Behind the curtain, however, plans for consolidation proceeded. On stage, they set in motion an experiment in participatory democracy, or at least, as it turned out, the semblance of one.

The post-Hult school board refused to examine the hard questions—the possible perverse consequences of choice in Boulder and whether to revise the policies of its predecessors. Instead it focused on the more ephemeral issue of restoring civility.

Whose Dream Schools?

Long before Zenith, while macropolitics played out at the district level, micropolitical conflicts proceeded at school. In the fall of 1996, Apex moved into the Adams building with one classroom each for kindergarten through fifth grades. Apex parents had chosen a "Lead Team" as its form of governance equivalent to the Site Based Team of Adams. The Lead Team acted as the executive body for a network of subcommittees that mirrored the organizational structure of Parents and Schools. The Core Knowledge Liaison Committee worked with the national Core Knowledge Foundation. The Goals and Accountability committee made recommendations to the Lead Team regarding student achievement and faculty evaluation. The Budgeting/Resource and Staff Allocation Committee made recommendations to the Lead Team on personnel selection and utilization, curriculum and staff development, leadership and school resources. The Enrollment and Publicity Committee worked directly with the district on enrollment issues, contacted potential parents and provided marketing for the school.

The team interviewed candidates for its teaching staff, and the district approved its choices. It oversaw acquisition of materials and equipment. It did almost all the things that a principal normally does. But in this case the principal merely attended the meetings of the Team as one of seventeen. Only one teacher (who was not also a Apex parent) served on the Lead Team.

As a matter of course, Parents and Schools made its resources available to Apex. For example, Parents and Schools counted among its membership lawyers, statistical consultants, management consultants, accountants, and doctors, all ready and eager to lend their expertise. Pierre Bourdieu defined cultural capital as "the hereditary transmission of power and privileges" (Bourdieu and Passeron, 1977, p. 487). The cultural capital that Parents and Schools transmitted may not have been hereditary, but it was power and privilege none the less. Furthermore, the Lead Team broke off a private nonprofit organization that, they argued, was not subject to state public records laws nor to the district policies on financial matters. As time went on less and less of the business of running the school was conducted in the Lead Team and more in meetings of the nonprofit board. Minutes of Lead Team meetings grew shorter (10 pages as contrasted with 100 pages of minutes of the Adams site based decision-making committee), and the minutes of the nonprofit board could not be accessed by anyone not affiliated with Apex.

Apex, in contrast with its neighbor across the firewall that separated them, raised enough money to purchase a computer and video equipment for each of its classrooms. The teacher of the Gifted and Talented Program, who was supposed to divide her time equally between Apex and Adams, spent most of her time tutoring math in Apex classes

(she was a Apex parent as well as teacher). Class sizes were kept low, and parent volunteers everywhere in evidence. In one year when statistics were kept, Apex parents volunteered over 10,000 hours. Not only did they assist the teachers in delivering the curriculum and individualizing instruction, they provided transportation to various events and also drove fifth graders to accelerated math classes at the middle school. They enhanced the per pupil allotment from the district with donations to offset the costs of various extras. Although the publicity for Apex called this donation voluntary, no parent seemed to avoid it. District policy prohibits such fund raising, but officials did nothing to oversee it, let alone stop it. Apex parents steadfastly refused to share any of this bounty with Adams. The differences in resources and opportunities that the extra money provided, however, could hardly escape the notice of Adams parents, teachers, and children. When the Adams fourth graders went on a field trip to the Museum of Natural History in Denver, Apex fourth graders flew to the Smithsonian in Washington, D.C.

School Choice or School's Choice?

At Apex, the Lead Team chose teachers after careful interviews to make sure they would follow the Core Knowledge curriculum. Reversing the culture in the district, Apex Lead Team made sure that its teachers had little autonomy over what and how they taught and no control over the operation of the school. Core Knowledge is a curriculum package that is meant to be "teacher-proof," that is, standardized and prescriptive. Since parents were so often in the classrooms, they could monitor how well teachers followed the prescriptions, and within the first six months, two teachers were pressured by parents to leave the school for teaching "Core Lite," or softened form of the real thing. When asked about the fate of these teachers, a founder responded, "Oh, the parents take care of them." Another commented, "I don't care what teacher I step on as long as my kid's interests are being met"

The Apex Lead Team also chose students. During the first two years, there were many more applicants than there were openings. Left unsupervised (it could always adjourn its meeting and reopen in its nonprofit entity), the team exercised its autonomy to choose whom they wanted. Since it was also able to conceal its records, no one could discern until later how its choices affected the diversity or past academic achievements of the Apex population. Later it was discovered that Apex played fast and loose with both district and state policy.

Colorado Revised Statutes (§ 22-1-102) requires that "Every public school shall be open for the admission of all children, between the ages of six and twenty-one years, residing in that district without the payment of tuition." The relevant district policy prohibits discrimination in admissions decisions. Federal regulation promises that schools violating nondiscrimination clauses will be denied federal grants. The Colorado Department of Education regulations limit the priority pools outside the lottery to ten percent of the school's enrollment. And although each level of authority professes fairness in principle, none monitors fairness in practice.

Contrary to both district policy and state statute that forbids discrimination, choice schools set up priority pools that limited free access. The Lead Team prioritized applicants into the following groups, or "pools": (1) children of Apex founding parents; (2) in-district children of Apex teachers with a half or more appointments for the current or next school year; (3) in-district siblings of current Apex students; (4) in-district siblings of Apex graduates (5) in-district children of Apex staff who are employed as half time or more (funded by Apex) (6) all other district applicants; (7) out-of-district applicants.

Children in Adams' neighborhood were not included in any of Apex's priority pools.

The stated selection process reads this way. If there turned out to be more applications than spaces available in a grade level (after exhausting the priority pools), the applications went into a lottery. Each application was assigned a number, the Lead Team transmitted those numbers to the district, a district official randomized the numbers and then returned the randomly ordered list of applicant numbers to the Lead Team, which thereafter announced the names of the students it selected. The district relied on an honor system to assure that all students had fair access. But the Lead Team did not always follow even these liberal rules. It regularly made exceptions for children who matched the school profile. Crude analyses after the fact revealed that half or more of the Apex enrollment was made up of children from the priority lists.¹⁹ Even assuming that the Lead Team followed the lottery results, half or fewer families applying for the choice program would even enter the lottery.

Choice advocates extol the virtues of the free market and claim that informed parents can make the best choices for their own children. However, when demand exceeds supply, as it did in Boulder, it is the schools that get to choose, not the parents. In this kind of market, the schools are likely to choose those families that can best fit its profile or contribute to its continued symbolic success by adding the value of the selected students' high test scores or other accomplishments (e.g., Labaree, 1997; Lauder and Hughes, 1999).

Expanding the Colonies

Since the opening day of the schools-within-schools, tensions were high and trust was low between Apex and Adams. Although the administration and board knew about the worsening conflicts, they failed to intervene.

Aware of the discord between the two schools, and before the board voted on the placement of Apex, the superintendent arranged for an open forum to air their respective grievances. On short notice, the Adams team scrambled to prepare its arguments. At the forum, while Adams complained, the Apex group sat calmly. Kay, its leader, merely reiterated Apex's cooperative attitude and hopes for rapprochement. Later she had this to say about the reaction of the Adams parents and teachers when they found out about the district's plans.

They seemed to be outraged when they came to the board And we were kind of surprised because we felt the board had indicated the direction it was going to go a year earlier and so I am still not quite sure why there was a lack of understanding.

Apex's calm was probably based on the group's awareness that most of the decisions about placement had been

made. District administrators and some board members had made these decisions out of the sight of the public and especially the Adams community, as much as a year in advance of when they were announced. As one of the Apex founders admitted, the principal, "certainly knew by the time she showed up that June (1995) before we opened" what was coming down the road.

After the 1995 election the new board voted to place Apex at Adams and appointed a Transition Team from the two schools to draft a "transition agreement" that would work out their difficulties. The board hired a mediator to make the transition "less bloody" claimed an Adams parent. In February of 1996 the first Transition Team meeting was held with the mediator. Negotiations continued for four months. Meanwhile, Damon instructed school principals throughout the district "to always be positive about these opportunities to provide exciting new educational choices and to make the best use of facilities." This memo effectively took the Adams principal out of the role of advocate for Adams. Thereafter the principal tried to keep things calm and remained on the sidelines. Apex pushed on toward the inevitable while Adams tried to hold it off.

The transition team eventually reached some agreements and resolved disputes concerning heavy street traffic, teacher aides, and use of facilities. Fund raising, scheduling of lunch and recess, and the role of the principal remained contentious. For Apex, the primary concern was autonomy as reflected in its separate identity and its definition of the role of principal as more of an observer and consultant to the Lead Team. The Adams group believed that the principal was the main authority in the school, the overseer of curricular, pedagogic, organizational and human matters. At Apex, the Lead Team and parent volunteers took those jobs. The Lead Team once considered eliminating the principal all together, but the board rejected that idea. Apex parents were insistent about what they wanted. It was an 'in your face' kind of thing, reported an Adams parent about the demands of the Apex transition team.

The transition agreement brought no peace. Shortly after the two schools signed it, the board asked Damon to resign. Lydia Swize replaced him on a temporary basis and promoted her friend—the Adams/Apex principal—to the central office. To fill the vacant principalship, the board appointed William Hart, formerly head of a prestigious private school. Although Apex liked his credentials the Lead Team was upset that the group had not been consulted about his appointment. The Lead Team worried that the new principal would not fill the subordinate role that it had assigned to his predecessor (especially regarding the power of the Lead Team to select curriculum and teachers and control finances). The Team took these concerns to the Assistant Superintendent (the superior of principals) who offered reassurance that he would personally serve as a go-between for Apex to make sure that district personnel would make no further decisions without consulting them. He also promised to maintain the Lead Team organization as it was. Members of the Lead Team interpreted his promise to mean that it could make most of the decisions. But at that point even Apex teachers had begun to complain about excess parent control.²⁰

While Adams parents and staff tried to adjust to their circumstances, Apex thrived and made noises about expanding. In response to Adams concerns the superintendent sent them a memo stating that "no such plans for expansion were under consideration" (which was, as we have noted, untrue). In fact, board member Saporito had already intervened in behalf of Apex expansion. She coached the Lead Team in how to package enrollment data in such a way that it would seem that the demand for Core Knowledge exceeded the current capacity at Apex-in Adams. She also guided them on how to advertise and to target advertising toward parents of children then in private schools and other parents known to be critical of their current school.

Despite the official moratorium on additional choice schools, the board had been working behind the scenes with Parents and Schools to restructure Cherry Middle School as a Core Knowledge focus school so that, when the Apex students advanced into grades six and beyond, they would have continuity of curriculum throughout their school years. The tentacles of the Core Knowledge expansion then moved in the direction of Eagle Elementary School, which, like Adams, fed its students into Cherry Middle School.

When the Eagle community got wind of this plan, and in view of the obvious preferences of the Hult board for expanding choice, the Eagle Parent Teacher Organization invited Adams parents to speak to the group. The Adams group minced no words. They made clear the difficulties they experienced with Apex under the same roof and especially with the backstage/on-stage actions of the board, the interim superintendent, and Parents and Schools. As a result of this meeting the Eagle community put up a concerted fight against such expansion plans.

Naturally this unmasking of the collaborative duplicity outraged all those who perpetrated it.

On stage at the February 1997 board meeting, Saporito spoke on behalf of "the many concerned citizens who want Core Knowledge" and urged the district to be creative in accommodating their needs. She brought statistics with her that purported to document that need. No one asked where those statistics had come from. Parents and Schools had made estimates of the demand from applications of parents for choice programs. If the parent listed four desirable choice options, that parent was counted four times to inflate the statistics. These pleas for fairness and rationality from the Hult board can be read as cover for what transpired out of public view, off stage.

At the last minute, Adams teachers and parents got wind of the proposal, and in desperation, presented its own counter-proposal to merge the two schools into one school that offered the Core Knowledge curriculum. What a good idea, they thought. This way the popular Core Knowledge curriculum could be grafted onto Adams, keeping it as at least in part a neighborhood school and adding to Apex the richness of Adams's Title I, special education, and English as a Second Language programs. Even the Apex teachers supported this plan—until the Lead Team found out about it. Over night, the Apex teachers withdrew their support and declined to sign the proposal. Whom the Team had hired, the Team could fire, or at least make their lives miserable until they quit.

For its part the Lead Team expressed derision toward Adams and its proposal, which, they claimed, smacked of desperation and insincerity. Apex didn't believe that Adams teachers knew enough Core Knowledge to teach it effectively. But very likely this proposal threatened the autonomy, the separate identity, and the exclusivity of Apex. One parent requested that the Board vote against the Adams proposal because it represented an "initiative as a disguised effort to kill Apex by converting the term 'core knowledge' into a vacuous advertising slogan and assimilating the program into business as usual."

The discourse of derision was nothing new to Apex, which had from the beginning characterized the Adams community as poorly behaved, silly, immature, inarticulate, liars and trouble makers. An Apex parent said,

I think the Adams community that were so vocally opposed to us took it to a level that was really nasty. They made accusations about us that were absolutely and emphatically wrong. They spread rumors about us that were wrong..... At Stonegate they never did that. They never fell to that. They just talked about what they were going to do. Adams just dwelled on all the things that they thought we were going to do.... Adams was never able to give a vision. They still don't have one.

According to Edelman, the political spectacle involves the rhetorical construction of friends and enemies. The Boulder case supports his view. Anyone who opposed any decision about choice on any principled basis was branded as an advocate of the status quo and an enemy of Core Knowledge or choice in general. Parents and Schools referred to Superintendent Damon as feeble, weak, incompetent, and the "Wizard of Oz." In an editorial cartoon, the Parents and Schools newsletter depicted the district as a Tyrannosaurus Rex. Anyone who was not a believer was viewed as an adversary. Anyone challenging Parents and Schools as elitist or discriminatory invited a barrage in the next day's news.

Critics of Parents and Schools complained that Apex systematically selected students and denied entrance to students from the full spectrum. Parents and Schools countered by defining diversity, not as a school's inclusiveness of students of poverty, color, or handicap. Instead they defined diversity as a school's openness to different curricula or to students from various parts of the district. As one wrote:

Diversity means more than just being from different ethnic backgrounds, although multicultural diversity is certainly part of the mix. Respect for diversity also means respect for people with different goals and desires for themselves and their children.... We must pass on to our children the common heritage and shared values that hold our nation together as one.

Efforts of Parents and Schools to portray itself in a good light exemplifies Edelman's theory of the social construction of self, friends, enemies, and leaders. The group did not forbear from manipulating symbols and statistics to promote its image and mission. Beginning with Janet Jones's misleading analysis of achievement scores in 1991, there followed a series of other such attempts. For example, Jones often cited studies that she claimed demonstrated the effectiveness of Core Knowledge and of its effectiveness for disadvantaged children. She did not (nor did the Core Knowledge Foundation web site when we tried to track them down) provide the foundation for her claim.²¹ In another example, Parents and Schools compared the achievement scores of children in schools of choice with children in neighborhood schools and attributed the advantage to superiority of the curriculum of choice schools. It ignored the selectivity of choice schools. It ignored lower class size and the amenities at choice schools. Instead, it attributed the higher test scores of schools of choice to parent involvement and superior programs. No matter how fallacious such accounts are constructed, the public seems not to question their validity. Nor did experts try to correct the misleading use of statistics. When ordinary citizens raised doubts, Parents and Schools called them amateurs, statistical illiterates, or enemies of school choice. This is how research is used in the political spectacle, as a rhetorical sword for partisans to wield, a way to appear rational and technical without the discipline and even-handedness of science at its best.

District Accommodation

Parents and Schools could not have been so successful if the school district had not accommodated its values and interests. By accommodation, we mean acquiescence—the gradual adaptation of the institutional values and the common goals of the representative body of decision-makers and administrators to the goals of a special interest.

This case study presents compelling evidence that district officials accommodated choice parents. The election of pro-choice school board members constitutes legitimate political activity. The accommodation by the district of political activities—both public and private, both conscious and unconscious—constitutes the politics of spectacle, bifurcating on-stage and back-stage actions. District officials accommodated simply by looking away. Perhaps they accommodated out of fear of reprisals, political or institutional. The Hult board's firing of administrators who challenged its pro-choice and anti-progressive policies represents an institutional reprisal. The following quotation from Parents and Schools literature represents a political threat of reprisal:

If the local school board refuses to approve requests for magnet programs with merit, we will elect better representatives in November. There is growing, powerful support for magnet programs in the state legislature and in the Colorado Department of Education. If the charter schools legislation is approved, as expected, during this session, we will have the option of appealing local school board decisions on magnet programs. Parents have the right and responsibility to define the education they want for their children.

Perhaps district accommodation can be thought of as a way of avoiding trouble from part of the community that had political power, as this quotation from a frustrated critic suggests:

The Apex parent leadership has become absolutely intoxicated with the power the board majority increasingly bestows upon them.... Why is the board majority willing to wholesale turnover the education of our children to these zealots?

The district accommodated by failing to adjudicate conflict and weigh in with factions with less power. Instead of substantive help the district offered only symbolic democracy. An Adams parent commented on the conflict between the Adams and Apex transition teams. Meeting of these committees:

...made this appear to be a decision that the school governing body, teachers and parents, had actually made. But really we were just duped by the whole process.... but the administration knew what was happening and they left it up to her to maneuver it through. We were just a rubber stamp for a decision that was already made. It had the appearance of a democratic process but it really wasn't.

But was district accommodation inevitable? To answer we describe contrasting cases of districts that acted differently.

In Boulder's closest neighbor to the north, St. Vrain Valley School District, elite parents did not exert enough pressure on the district administration to obtain special treatment. The superintendent and board took a strong stand when they declared that any charter school in the district would be subject to strict oversight. In particular, the board made known its intention to take legal action to counter any attempt to establish schools that would select a single stratum from the student population. When asked to compare the St. Vrain district with Boulder's, the board president stated that the St. Vrain community was generally satisfied with its schools. Two applications for elementary charter schools and one application for a charter high school were submitted. The board ruled that since the two elementary school proposals were substantially the same, they should be merged into one. That charter was subsequently approved and opened. The board denied the only application for a charter high school application because the proposal failed to include a "responsible" fiscal plan. The charter school applicants appealed the district's decision to the Colorado Board of Education, an appeal built into the Colorado law. The State Board overturned the district's decision, and the school opened. Less than one year into its operation, the school's poor management had culminated in financial shortages, and the district took over the school's operation.

Cherry Creek District south of Denver, with demographics similar to those of Boulder, also provides relevant comparisons. The board approved only two choice options because the programs proposed were different from the district's regular programs. Elite parents exerted pressure, but a Cherry Creek administrator, responding to a question about why so few choice schools operated there, said, "We fund our schools and we know how to say no."

These two examples show that, even considering the pro-choice policies at the state level, capitulation to the elite parents in Boulder was not inevitable. There were alternatives that the district could have pursued that could have led, potentially, to a more even-handed outcome. First, the district could have insured that all students had an equal opportunity to enroll in choice programs. While racial quotas have recently been ruled unconstitutional, the district could have required that choice schools enroll the same percentage of free lunch students as reflected in the district. The net result of this policy would tend to serve the same purpose as a racial quota. Second, the district could have monitored enrollment procedures, particularly to insure that enrollment priority pools of choice schools conformed to state law and district policy.²² Third, the district could have required choice school applications to provide unique programs that did not duplicate existing district programs. BVSD has many programs that market themselves as academically rigorous. Fourth, the district administration or the board could have closely scrutinized the business and financial plans and operations of the choice schools. Although most choice schools in Boulder have not had financial problems, prudent monitoring by the district would have required schools to follow policy regarding fund raising and private donations.²³ The district could have insisted upon broad and fair discussions involving all constituency groups with a stake in the policy. It could have intervened to make the discussions more equal. The district could have analyzed the potential costs and risks of choice schools to the broader community. The district could have performed an evaluation of the schools after they were in operation. The district did none of these things.

Democracy: Deliberative and Faux

Just because the post-Hult board and administration did nothing to mitigate the hegemony of elite parents does not mean it did nothing at all. What happened next represents a triumph of symbolic politics over deliberative democracy.

Contemporary political theory and philosophy recommends democratic deliberation as a way of broadening participation on civic projects and strengthening its fairness. Amy Gutmann described the deliberative process as one of three cornerstones by which citizens can deal with disagreements in democratic societies.

Procedures are necessary for the fair and peaceful resolution of moral conflicts.... If political equals disagree on moral matters, the greater number rather than the lesser number should normally rule.... But for procedures to be fair, citizens must appreciate the value of fairness.... Fundamental constitutional values...serve as constraints on majority rule.... American constitutional democracy recognizes certain substantive values not only as preconditions to a fair democratic process but also as fundamental values independent of that process, and as such, they represent a second basis for resolving political disagreements.... The third way that democracies can deal with disagreements is by citizens and public officials deliberating over the moral disagreements that proceduralism and constitutionalism, taken alone, leave unresolved. Deliberation is public discussion and decision making that aim to reach a justifiable resolution...and to live respectfully with those reasonable disagreements that remain unresolvable.... individual citizens should be regarded as moral agents who deserve equal respect in any justifications of basic procedures and constitutional rights.... Deliberation calls upon citizens and public officials to try to justify our political positions to one another and in so doing to take into account the viewpoints of others who reasonably disagree with us. (Gutmann, 2000, pp. 73-76)

When the post-Hult board in Boulder contemplated the complex set of changes that the district had experienced over the previous decade, it backed away from confronting them head on. The mood seemed to be that decisions already made to enhance school choice could not be remade, even if the board had the political will to do so. Instead it

commissioned University of Colorado researchers Kenneth Howe and Margaret Eisenhart to study the consequences of school choice.

The district did not wait for the results of their study. Meanwhile, the new superintendent still faced the dilemma of growth in the suburbs. To build new schools he believed it was necessary to close some schools on the west side. His dilemma was how to accomplish the closings without causing a new generation of political upheaval. An administrator from that era admitted:

Parts of our community are much less likely to be included in an effort like consolidation because of the perceived power of that community. That's a hard issue but it's somewhat the way things are.... If they had a powerful population maybe we wouldn't have chosen that school [for closure].

In April, 1998, the superintendent announced his "hit list" of schools under consideration for closure. Some of the schools on the list had high rates of poor and non-white students. The board called public meetings to present the proposal. The meetings turned into shouting matches when neighborhood families resisted the district proposal to close their schools. They complained that the district had neglected to inform them or to give them a voice in the decisions. They argued that the district had failed to justify its decision on adequate statistical information. Some members of the Facility Master Plan committee, which the board had appointed to assist them, agreed with the parents. The board retreated from its plans and postponed consolidation talks to a later time when the public could be more involved.

In September the board passed a resolution to start a deliberative process to advise the board on future school consolidation. Item #4 of the resolution stated:

That the Board make decisions regarding facility usage by January of 2001. Implementation of any Board decision would take place no sooner than fall of 2001, giving staff, students, and parents time for transition.

At the same time the Facility Master Plan Committee was working to gather information about district buildings so that it could be used as a guide for future decisions regarding facilities. Some committee members were concerned that consolidation would necessitate bussing of children, which in turn would exacerbate traffic and pollution problems. In September the committee presented its report to the board. The Master Plan included 13 strategies to address enrollment shifts. One of those strategies was school consolidation.

Since decisions regarding closures/consolidations are not popular with affected neighborhoods, the School District should develop a comprehensive public process for evaluating possible consolidations/closures.

Thereafter, the board began discussions with the Colorado Association of School Boards (CASB) to aid the district in designing a deliberative process. At first board members seemed genuine in their efforts to gather information and include the public in facilities usage decisions. But they also knew that a decision had to be reached. Whatever their intentions, the deliberative process that CASB implemented failed to yield recommendations.²⁴ Thus intentions failed to match policy instruments, but were transformed in the process of implementation.²⁵ By April, board minutes indicated a change in the committee's responsibilities. The committee would no longer advise the board on school consolidation, as the resolution stated but rather deliberate as "a public exercise."

The new charge to the Committee was to

...give the process legitimacy throughout the community; create a dialogue with the entire community; reach out to community members whose voices are not often heard; empower the committee to be productive by investing them with the responsibility for the success of the process.

Thirty-six members were appointed to serve on the committee. Board members appointed one member each. The rest of the members were selected to represent the municipalities within the district as well as proponents of school choice. District officials selected other members, primarily people of color, to insure diversity. Although it was a goal to find representatives that hadn't already served on district committees, many members were familiar faces to school district committees and politics. At the time choice schools enrolled less than 15 percent of the district's students. Almost 33 percent of the group's representatives were affiliated with choice schools.

The first meeting for the deliberative process was held in April 1999. CASB Facilitator Jane Urschel started the session by explaining the group's charge:

The board does not expect the community to make a decision-that is the board's responsibility.... The advisory committee will not take a vote. Its job is to help the citizens of the district deliberate and reach a "public judgment." The board wants to "listen in" on the community as it works toward a public judgment and wrestles with the tough choices confronting the district.

One member took umbrage, saying afterwards:

I volunteered for the committee because the District's notice said that the committee would be making recommendations to the Board about pressing issues of closure/consolidation and choice.... It's a bait and switch.

A district administrator noted that committee members came with a variety of expectations and personal agendas:

Some were there to fight consolidation. Some were there because of the school choice stuff, to make sure their interests were being met. Most of them came with some type of territory they were protecting.

During an 8-month period the advisory group met more than 12 times. Each session was about three hours long. Members attempted to redirect the discussion to the issues of closure, consolidation and choice, the topics they believed were the primary charge they had been given. But Urschel insisted on the symbolic process of general discussion. Finally, the committee members, many reluctantly, gave in.

The first task for the committee was to frame the issue the public would deliberate. After many sessions the group framed the following question, "Making Choices: How can we best use our resources to ensure all children receive an excellent education?" The group then grappled with writing five responses, both pro and con, with arguments for each. Committee members spent many sessions debating and refining the responses. After eight months the question and responses were compiled into booklets that would serve as the guide for future study circles that the public would be invited to participate in.

In December 1999, as the committee finalized the booklets and before any study circles had met, the board announced the closure of two elementary schools. There could no longer be any mistake. The Committee was just a symbol, a shadow of democratic deliberation, nothing like Gutmann's model. The board had based its decision on recommendations that district administrators had made and on behind the scenes discussions with its constituencies, but irrespective of the Committee. The marks of choice advocates were apparent. According to a district administrator, during these months, the parent board of Promontory Charter Middle School had:

...stayed very quiet during consolidation. They knew that if people caught on to the possibility that they might get their own school they'd be ticked off about it.... They were worried that if they were seen as advocating for it (consolidation) it would fire up the opposition.

One board member commented to a small group of people that the Promontory founder "was drooling" over this possibility of moving into one of those soon-to-be-vacated elementary school buildings and having it for itself.

Most members of the deliberative process team were angry that the board would proceed with such plans before the Deliberative Process had completed their work and before the 2-year moratorium on school consolidation had lapsed:

We are a committee that is supposed to be pulling the community in to have these conversations about what we want our district to look like. This big heavy-duty stuff is going on over here by the administration and the school board. Essentially it was a smoke screen because they never wanted to hear from the community anyway. They decided that in order to have an excellent education you had to close schools and that's what they were going to do anyway.

At the center of much of the public debate on the board plans to consolidate was the actual choice of schools:

When they actually closed and consolidated schools they hit the most politically incompetent schools.... But not Jefferson! Those people created politics. And nothing ever happens to Monroe because those people are too politically suave.

The two schools destined for closure were located in neighborhoods like the Adams neighborhood—some of the few affordable places left in Boulder for young families to buy a home and where many less advantaged families lived. At one of them, for example, thirty nine percent of its 312 students were eligible for free lunch (compared to less than 20 percent across the district as a whole). Almost one-third were Limited English Proficient (LEP). Forty-three percent were children of color. Once again, the board had taken the more expedient route, targeting the families with the least cultural capital, those who would likely put up the least resistance. It was unclear whether the proposed closures would result in any savings.

The deliberative process committee, working in public, had contributed nothing to the district's off-stage decision making. Specifically, said one member:

The Ed center had no time, no respect, and no regard for this task force. It was just thought of as a cumbersome waste of time.... They saw it as something keeping them from doing their job. They wanted to get on with closing schools and we were standing in their way.

Unlike the school district, the city of Boulder was committed to preserving its neighborhood schools. One city council member discussed the possibility of using city excise tax to keep the schools open. Although committing money from excise taxes turned out to be illegal, city officials offered several recommendations to the board, among

them to give neighborhood children priority enrollment into schools converted to choice schools. The city also recommended that the district conduct an impact study to assess public and private costs for transportation, and a mitigation and safe access plan. The board resisted any attempt by the city council to interfere with board decisions and did not act on any of the city councils suggestions.

After the board made its official decision, one member of the Deliberative Process committee resigned. Others stopped attending meetings. He commented:

I can't do this anymore. I'm not going to waste time on something irrelevant. They (board members) wanted to get Promontory [charter school] in somewhere and that was their hidden agenda. I think they ... decided it among them because when they took the vote there was no discussion [at the board meeting].

In February the few remaining Deliberative Process committee members—more than half of them advocates of school choice --organized study circles to discuss the question and responses they had spent the past year creating. Nineteen study circles were held, none of them in the areas affected by the consolidation. The report the committee issued to the board (August, 2000) contained five themes that the study circles generated. But everyone was aware by then that any deliberation that took place did not affect decisions made by the board, at most the committee served as a cover for decisions on behalf of the most advantaged parts of the community, not necessarily for the common good.

Choice Effects in Boulder and Beyond

Parents and Schools echoed neo-liberals worldwide when they claimed that choice benefits all parts of society. They scoffed at the idea that choice policies actually exacerbate existing inequalities in social life generally and school achievement specifically. They discounted the possibility that families with fewer resources and less cultural capital might lack complete information on which to make a choice or might value schools in their neighborhood. They went further to label as "racist" any such doubts. They held fast to the notion that free market solutions were preferable to government imposed neighborhood school boundaries, which tended to isolate poor children in bad schools. They ignored issues of community, transportation, and dispositions that might discourage the willingness or ability of some people to make such choices. So deep were the beliefs of the members of Parents and Schools that they readily looked beyond equivocal or negative evidence or found reasons for discrediting it.²⁶

In the political spectacle, however, one set of claims is made onstage (e.g., enhancing equity) and another is hidden behind the scenes (e.g., maintaining privilege).

In Edelman's words:

In politics, moreover, the incentive to preserve privileges or to end inequalities is always crucial, offering fertile psychological ground for using language and action strategically, including slippery definitions of means, ends, costs, benefits, and rationality (Edelman, 1988, p. 109).

Clearly, elite parents manipulated the instruments of choice policy in Boulder. But they were not alone. Research by Elizabeth Graue and Stephanie Smith showed that elite parents used back-stage political pressure to undermine progressive reforms in math classes. The educators had attempted to remove ability grouping and implement problem-solving and cooperative learning. But the parents believed that homogeneous classes with traditional instruction had successfully prepared their children to win the credentials race, (Graue and Smith, 1996) as Labaree described it (Labaree, 1997).

In their study of schools that attempted to eliminate ability grouping, Amy Stuart Wells and Irene Serna identified four strategies that elite parents used to undermine this reform.²⁷ First, elite parents threatened to withdraw their students from the "detracked" school if their children were not given the specialized curricula they demanded. Second, elite parents co-opted institutional elites by directly influencing school administrators, pressing their case until they gained advocates from within the school to create specialized placements for their students. Third, high status parents recruited the "not quite elites" to press their case for them. Parents of students in Advanced Placement classes convinced the parents of students in the next highest track to lobby for a return to tracking. The authors point, in particular, to school site-based decision-making teams that end up pushing for programs such as Advanced Placement, honors programs, and other programs that select on the basis of academic ability. In response, schools offered bribes to elite parents to keep their children in a de-tracked school or a magnet school: For example, a school might promise small classes or the best teachers to elite parents to convince them not to withdraw their children and send them to another school that offered high, homogeneous, and selective tracks (Wells and Serna, 1996). Graue and Smith believe that such strategies to restore the hierarchically arranged classes and schools have the effect of increasing stratification among schools and diminishing the quality of educational opportunities for the poor (Graue and Smith, 1996).

In their case study of choice programs in four large urban systems, Donald Moore and Susan Davenport found that students, after the introduction of magnet schools, seemed to have a broader array of schools and programs from which to choose. But many of these options were open only to select groups of students. Choice schools were less than fair in their admission practices. Students at risk were much less likely to apply to or be selected by the schools that advertised themselves as advanced academically. Most working class and poor parents did not comprehend the application process to select schools. They were less likely to catch on to what elite parents knew: that if the schools were pushed hard enough they might well admit students who fell below the required admission standards. Junior high school counselors, even when they were available, tended to direct low-income students into less selective high schools. Programs such as the International Baccalaureate selectively advertised to students with only the top

academic records and scores. Academic schools systematically excluded special education students and students whose first language was not English. The high track, academically selective schools also attracted the best teachers and the most resources from the district. Even when admitted to an academically selective school, students who failed to conform to its profile found themselves forced out. Finally, districts pressured school administrators to raise and maintain high test scores lest elite parents remove their high scoring children.²⁸ All of these practices further segregated children of color and poverty in the least desirable schools or tracks or schools-within-schools and thereby consigned them to the fewest educational opportunities (Moore and Davenport, 1990).²⁹

Hugh Lauder and David Hughes conducted research in New Zealand where school choice policies have had more influence than they have in the United States (Lauder and Hughes, 1999). Their research was conducted in an urban setting where transportation to schools outside students' neighborhood did not prevent choice of schools, as it often does in American settings. Their research tested hypotheses gleaned from both critics and advocates of school choice by statistically examining the relationships among social class and ethnicity of students, the level of academics in four high schools, and academic achievement (both of students prior to admission and to the schools' effect on subsequent achievement). They found that most lower class students in high academic schools were there not because of successful application, but because they lived in the schools' catchment area. Of the students who applied to the high status academic schools, there was a strong relationship between their successful admission and their social class. Furthermore, the following conditions exacerbated stratification of the schools:

Students from high SES background have the greatest opportunity to avoid working class schools, and most take it.... students with the highest SES background in a neighbourhood [sic] are most likely to exercise choice..... exit from working class schools induces a spiral of decline,³⁰... whereas schools with more applicants than spaces "effectively insulate themselves from the effects of the market (Lauder and Hughes, 1999), 101.

The authors argue that stratified opportunities result in disparities in subsequent achievement, and that such effects accumulate over multiple years of disparate opportunities.

Despite the remarkable consistency of findings among the studies of the effects of school choice, we do not have to look beyond Boulder to get a reading on the effects of the choice movement there. In 1999 the board of education finally decided to commission an independent analysis of the ramifications of its decisions about school choice. As a result of that analysis, Ken Howe and Margaret Eisenhart concluded that the district's policy had resulted in 16 choice schools attended by 20 percent of the district students. But families that availed themselves of choice options were not representative of the district as a whole.

This deserves the name 'skimming' because some schools are drawing a disproportionate number of students from the high scoring pool... whereas other schools are losing a disproportionate number (Howe and Eisenhart, 2000, p. 10).

Their study also showed that, "Race/ethnicity is a prominent feature of open enrollment patterns.... students are leaving regions with higher percentages of minorities. Whites are disproportionately requesting open enrollment in schools with high test scores" (Howe and Eisenhart, 2000). Boulder schools have become substantially more stratified by ethnicity since the district adopted school choice policies.

Howe and Eisenhart concluded that the process by which choice schools recruit families contributes directly to the increased stratification. For example, applications that are contingent on donations, requirements that parents volunteer a certain number of hours, and transportation costs all discriminate against families with low incomes and constrained schedules. They took to task priority pools, stating that giving priorities to founders' children and others produce unfairness.

Howe and Eisenhart also pointed out that, because of the district's system of funding schools, when advantaged families leave their neighborhood school for a charter or focus school, district funds follow. This drains the budgets of the neighborhood schools, thus exacerbating the disparities in resources. Those schools then enter a downward spiral for those who are left behind. They suggested several remedies for the vast disparities that exist in private funds parents donate to schools of choice in contrast to neighborhood schools, particularly in less advantaged neighborhoods.

Although surveys showed that parents of both neighborhood schools and schools of choice were satisfied with their schools, the majority of respondents also believed choice had negatively affected both the sense of local community and the collegiality of the professionals. Finally, the authors recommended that the district oversee the application process, particularly of the lottery, to increase fairness (Howe and Eisenhart, 2000).

But in Boulder, the decisions were already made. All five neighborhood schools in the city that were closed because of low enrollment have since been converted to schools of choice.

School Choice and the Illusion of Democracy

Horace Mann envisioned a system of schools financed by state taxes and available to all, indeed, providing equal education to all. He believed that providing equal education for all children, irrespective of family origin and wealth promotes the common good. Democratic participation by citizens in the goals and operations of schools would direct schools toward fair (or at least majoritarian) ends. Mann's vision was realized, in part, even though the U.S. Constitution and Bill of Rights made no mention of public schools. That the system was constructed at all, let alone that it has endured, must be testament to deeply held sentiments about educational rights and the public good.

To neoliberals, democracy is not something like the cultural vision of citizens gathered around the pot-bellied

stove at the general store, debating and voting on the ways to run schools. Instead, neoliberals define democratic participation as individuals exercising their rights to make choices in a free market of schools. The public good they define as the aggregate of individual choices of schools. The school choice movement means to take the public out of public schools.

In spite of Mann's ideals, almost from the beginning of American public schools, parents sought to abandon them. Elite families avoided the public schools in favor of selective private schools for their children. For their own children, they did not want what was available to all. Irish immigrants withheld their children from public schools because of their profound Protestant bias. White southerners pressed the state to provide schools for their children that would exclude former slaves. When the Supreme Court struck down that possibility, they sent their children to private academies for whites only.

Contrary to what neoliberals and the rest of the choice advocates say, therefore, public schools have never been monopolies, let alone socialist schools or government schools, or whatever incendiary labels they might deploy. School choice was ever available, at least to some families.

Families with sufficient financial resources could always separate their children from the common school. Anyon's history of Newark public schools followed its centripetal course from commons and commoners.³¹ Industrial leaders moved their families from the core to the periphery of the city, later from the periphery to the suburbs. The fathers commuted by trolley, later by car, from their homes to their factories, passing within sight of the increasingly congested and poor neighborhoods. Wives and children of the industrialists lost visual access to the neighborhoods and schools they had left behind. Later still, the industrialists moved the factories themselves away from the city. They lost, therefore, even the chance to see the conditions they left behind.

This trajectory created the relationship between neighborhood and school, between class, labor, and education. The cultural and political capital of the industrial elite solidified the relationship by vesting school finance at the local level. The economically poor would become educationally poorer over time. A two-tiered system was in the making.

As the wealthiest families abandoned the poor and working class families to the schools in the core cities, they took with them not only their financial advantages to pour into their own schools. They also invented justification for separation and relative deprivation. They were able to tolerate school conditions for the poor that they would never have tolerated for their own children. They invented the ideology of the neighborhood school. Later they used that image to justify a system highly differentiated by class and race and to resist judicial efforts to desegregate. Still later they used the image of neighborhood schools to persuade Federal courts to lift long-standing desegregation orders (claiming that the virtues of neighborhood schools for their own children outweighed the virtues of desegregated schools for minority children).

So school choice has always been. What is new about school choice is the political pressure by elite parents on the State to subsidize—from the public treasury—the abandonment of the common school. Just the contrary of Horace Mann's ideals. Demands for charter schools and private school vouchers count merely as an extension of the more-than-a-century-long desertion of advantaged families from public schools and the common good.

In Colorado, choice policy provided political opportunities. In Boulder, elite parents took advantage of those opportunities to exert disproportionate power over the distribution of values. They professed public interests in public while pursuing private interests in private. They silenced opposition, practiced the discourse of derision, made a mockery of democratic deliberation. They conducted business in private and capitalized on connections and media savvy. They thoroughly cowed the district officials (who ought to have taken responsibility for re-balancing cultural and financial capital) to get what they wanted for their children—for only their own children. And so they did: special tracks, programs, trips, opportunities, smaller and more exclusive classes and schools. Parents won the right to control the schools, select the teachers and curriculum, select students like their own while excluding others.

Absent political spectacle, could choice policies have transformed public schools so thoroughly in Boulder, in Arizona or New Zealand? Political spectacle diminishes democracy. Weakened democracy nourishes political spectacle. In the political spectacle, even the words "choice," or the word, "market," fog the mind. Most people eat the thin gruel of words while the few operate backstage to obtain more tangible items for themselves.

No matter how much political conservatives dress up demands for school choice in the language of equity and liberty and free market, the sad truth is that not every parent will make choices, or will make informed choices, or will make choices that further the common good or that the best educational choices will be available to all or even available at all. Further, compelling research suggests that the fate of American schools in the hands of people with the most cultural and political capital is one of even greater separation, segregation, and differential opportunities than exists now (Lauder and Hughes, 1999; Cobb and Glass, 2000; Moore and Davenport, 1990; Wells and Serna, 1996; Wilson, 2000).

And what might that bring? A post-Fordist analysis would suggest that schools and programs will proliferate, but what is available to some will not be available to all. Schools and types of students will be increasingly segregated and separated. There is every reason to predict, therefore, that wealth and cultural capital will diverge even more. Free markets create winners and losers. Devolution of responsibility will benefit only the schools for the socially advantaged. The State will retain ultimate authority for system goals and means of accountability and will exercise these means to punish and further isolate schools for children of poverty and color. And it all will happen off-stage.

Notes

¹The material in this report is a version of chapter three in *Political Spectacle and the Fate of American Schools* (Smith, M.L. with Miller-Kahn, L., Fey, Patricia, Heinecke, W. & Noble, A.). The book will be published in 2002 by Routledge/Falmer Press in Michael Apple's series in critical perspectives in education. The authors appreciate the cooperation among editors and publishers to be able to include this research in the Archives.

²On the Public Broadcasting Network broadcast of *The History of American Schools* (September 4, 2001), former

Reagan Department of Education official Chester Finn made this argument—that schools are the only things that Americans cannot change. The producers failed to ask him about the place of libraries, fire and police departments, prisons, public hospitals, highways, trash removal, and a long list of other public institutions that occupy the same relationship between individual and state. Such is the role of language in the political spectacle—it fogs the mind to the point that audiences fail to question it.

³Other parts of the coalition invoked these parents of color whenever they needed to counter the claims of critics that school choice favored the already advantaged parts of society.

⁴Recall an incident that occurred during the 2000 post election campaign, in which one candidate held a press conference. Behind the podium with the official seal were two American flags. Later, a candidate from the other party gave a press conference with five American flags backing him. Still later a candidate appeared before a huge array of flags. This time, the candidates went too far, and their posing provided fodder for comedians. The transporting of disputed ballots from Miami to Tallahassee provided another opportunity for dramatic staging. Television cameras in helicopters focused on the trucks the entire length of the trip. Media over reports the dramatic and the visual.

⁵Edelman refers to democratic participation and rationality as myths. We prefer the possibility of both, but recognize that in the political spectacle, they are apt to be absent. Therefore we refer to them as illusions.

⁶The movement of both national parties to the political center may then result from both listening to the same polls.

⁷Herbst, S. (1993). *Numbered voices: How public opinion polling has shaped American politics*. Chicago, University of Chicago Press, p. 50.

⁸Herbst, p. 156

⁹The arguments above do not discount entirely the place of research in policy. Far from it. Properly interpreted, research studies can contribute to policy arguments. Moreover, for politicians and policy makers to ignore the research literature may also constitute irrationality. George W. Bush, when he was governor of Texas, aimed his education policies at ending "social promotion." He sought to replace the movement of students from grade to grade based on age with a procedure based on test results. Those who failed the test failed the grade. Anyone that advocates a policy such as this must deliberately ignore a body of contrary research that consistently shows the ineffectiveness of grade repetition. Not only do repeaters make little progress they are also much more likely to drop out of school instead of graduating. Bush also had to overlook the inconvenient fact that even before his policy Texas schools practiced little social promotion. Grade retention rates were high in comparison with other states.

¹⁰A reference to the Lawrence Schiller (1999) book *Perfect Murder in a Perfect Town* about the Jon Benet Ramsey case in Boulder about the same time as these data were collected.

¹¹In this article, we use the names of public figures. Any other characters have been given pseudonyms.

¹²At the time the parent corporation of the Camera was Knight Ridder. Note that examples and tallies are available in Miller-Kahn, 2000.

¹³State statute and district policy also must conform to Federal law, specifically the Improving America's Schools Act of 1994. Part C—Public Charter Schools, allows for federal grant money allocated to states for Charter schools. The exact language follows: "In General—The Secretary may award grants to State educational agencies having applications approved pursuant to section 10303 to enable such agencies to conduct a charter school program in accordance with this part."

¹⁴These disputed images of focus schools vis-a-vis charter schools echoed the disparate images of charter schools vis-a-vis vouchers. Choice advocates see charters as entrees to the preferable alternative of vouchers where as public school advocates see charters as ways to preempt vouchers. Parents could use the Charter School Act as a "threat" to force the district to create magnet schools. Districts propose the lesser evil from their point of view to cool out or dampen the determination of parent advocates of choice.

¹⁵One year later Stonegate was approved as a focus school in its own right. Active parents at the school believed that the designation protected them from advances from other focus school proposals and a school board sympathetic to school choice.

¹⁶Swize and the Adams principal (also a close friend of Swize) met with Apex's founders to discuss the eventual siting of Apex at Adams but parents and teachers were never informed of the meetings.

¹⁷See, for example, (Bourdieu, 1977).

¹⁸Hult proposed deleting Marine's resignation speech from the board minutes but that motion failed.

¹⁹At the Montessori Focus School, priority listed students also took most of the available slots. The founders of Zenith, the K-12 charter school, adopted similar guidelines but defined as "founder" anyone who paid a fee to get on the list of applicants. That way, any family on the list would be exempt from the lottery and there would be fewer slots determined by lot.

²⁰Apex teachers threatened to walk out on two occasions because parents interfered with professional decisions. The district knew of the problems and once again paid for a trained mediator to help teachers and parents work out their problems. The mediator found that the teachers' concerns were real and suggested that the governance structure be revamped to include more faculty representation on the Lead Team.

²¹A further investigation of the Core Knowledge Foundation website listed its own research to support the claim that Core Knowledge curriculum was superior to the curriculum of most school districts. The website did refer to a recent, independent, longitudinal study on Core Knowledge conducted by John Hopkins University. The study was funded by the Walton Foundation, a group that has issued grants to Core Knowledge schools across the country for several years. In an abstract written by a Core Knowledge employee, the researchers claimed that in schools where Core Knowledge was consistently implemented the results were promising. They did, however, state that the positive results were not necessarily due to the Core Knowledge curriculum, but more likely the result of a consistently applied program (Marshall, 1999).

²²Nine months after the CU report on open enrollment that recommended that the district handle all choice applications to insure an equitable process the Zenith web site still instructed parents to send two applications directly to the school. One application was for school purposes and the other would be turned into the district for oversight.

²³Fund raising was another problematic area according to the CU report.

²⁴The National Issues Forum format, selected by the CASB^o facilitators for the deliberative process, was not designed to create recommendations, especially the kind that Resolution 98-18 required. This may have been a plus for board members who felt that their decision-making abilities might be threatened by the group's outcome.

²⁵Intentions of policy makers frequently get transformed through the various layers of implementation. See (Hall, 1995).

²⁶Anyon, J. (1997). *Ghetto Schooling : A Political Economy of School Reform*. New York, Teachers College Press.

²⁷This study focused on de-tracking within schools. Only two of their ten cases were magnet schools per se. Nevertheless, their findings are relevant here, because schools of choice in a position to select their students will select the students that best fit their profiles, whether arts magnets or accelerated academic achievement magnets. Selecting within a school building for homogeneous groups of successful students follows the same principle (Wells and Serna, 1996).

²⁸(Moore and Davenport, 1990).

²⁹Both of the studies just described emphasized the negative consequences involved with the use of achievement tests to select students or to establish accountability. Most standardized tests are systematically biased by socio-economic status. Therefore, to use test scores as the basis of admission to special schools or programs is automatically to produce schools stratified according to social class, and by extension, to race (Moore and Davenport, 1990) and (Wells and Serna, 1996).

³⁰They decline rather than close, as the market theorists would have predicted, these schools stay open and work on advertising and public image such as pushing increases in test scores (Lauder and Hughes, 1999).

³¹Also see (Anyon, 1997).

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Education Policy Analysis Archives

Volume 9 Number 51

December 8, 2001

ISSN 1068-2341

A peer-reviewed scholarly journal

Editor: Gene V Glass

College of Education

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Articles appearing in EPAA are abstracted in the *Current Index to Journals in Education* by the ERIC Clearinghouse on Assessment and Evaluation and are permanently archived in *Resources in Education*.

Gender Barriers in Higher Education: The Case of Taiwan

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Citation: Wang, R. (2001, December 8). Barriers in higher education: The case of Taiwan, *Education Policy Analysis Archives*, 9 (51). Retrieved [date] from <http://epaa.asu.edu/epaa/v9n51/>.

Abstract

As a consequence of the rapid expansion of higher education in Taiwan over the past decades, the enrolment of females in higher education has grown considerably. However, this article reports that in terms of institutional difference, access to advanced study, and differing subject preferences, the barriers to women's participation in higher education remain. Thus, the findings drawn from this article lead to the conclusion that females still suffer disadvantages in access to higher education, although the expansion of higher education in Taiwan has substantially benefited females over the past few decades

Introduction

In Taiwan, there has been a significant diminution in gender inequality in entrance into higher education, as is shown in Figure 1. Figure 1 indicates that only about 11 per cent of the students enrolled in higher education in 1950 were female, while by 1998 the percentage had increased to approximately half (50.36%). This shows a remarkable increase in the number of women entering higher education, largely as a result of the rapid expansion in higher education over the past decades.

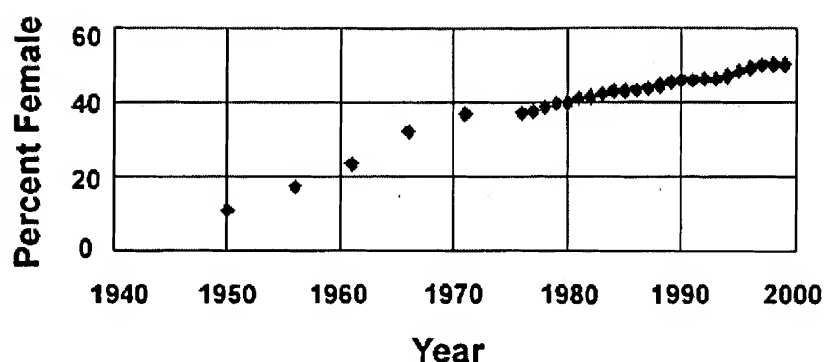


Figure 1. The Percentage of Females in Higher Education by School Year 1950-99.
(Source: Ministry of Education, 2000a, Education Statistical Indicators, p. 33.)

In fact, the increase in female access to higher education in Taiwan has been in line with that of the worldwide increase. The UNESCO World Education Report for 1998 revealed a general trend in female intake into higher education, and showed that in terms of the gross enrolment ratio (females to males), female students have significantly increased in number in OECD countries. For example, in Australia in 1985, the gross enrolment ratio of female in tertiary education was about 27.0 per cent. The figure increased to 73.5 per cent in 1995. Over the same period some OECD countries have experienced similar increases in this regard, as indicated in Table 1.

Table 1
Gross Enrolment Ratios of Female in Tertiary Education
in Some OECD Countries

	1985 (%)	1995 (%)
Australia	27.0	73.5
Canada	77.7	110.2
France	30.3	55.4
Germany	...	38.5
Japan	19.8	36.3
Netherlands	26.6	46.0
Spain	28.6	49.8
United Kingdom	20.1	50.8
United States of America	64.3	91.7

(Source: UNESCO, 1998, World Education Report, 1998, pp.148-151.)

However, there is a growing concern with the issues relating to female participation in higher education in Taiwan recently due to the democratization of society in Taiwan. The main purpose of this paper is therefore to examine gender barriers in higher education in Taiwan, and the following sections will pay attention to three aspects of female access to higher education: (1) the representation of females as students among different types of institution of higher education i.e. university, college and junior college; (2) the distribution of females as students in advanced study i.e. for a master's degree and a doctor's degree; (3) female choice of subjects of study. Finally, some observations are concluded from the previous examination.

Female Access to University vs. Non-university Institutions of Higher Education

As indicated earlier, opportunities for women to study in higher education in Taiwan have significantly increased over the past decades, as seen by the relatively high proportion of females now entering higher education. Nevertheless, the focus should now move on from the problem of how to increase female participation in higher education in general, to an examination of the fact that there is a noticeable difference in the numbers of females attending university and the numbers of females attending the lower level non-university institutions in higher education. In terms of institutional difference females are under-represented in university institutions (universities and colleges) and over-represented in non-university institutions (junior colleges). This conclusion can be drawn from the following statistical information. In 1996/1997 females made up about 46.48 per cent of the total number of students attending university and college sectors, while they comprised 53.51 percent at junior colleges (See Tables 2 and 3).

Table 2
The Number and Percentage of Students Enrolled in Universities and Colleges by Gender and Subject in 1996/97

	Humanities	Social Sciences	Science & Tech.	Total
Females	61,353 69.85%	81,398 58.16%	53,531 27.53%	196,282 46.48%
Males	26,493 30.15%	58,569 41.84%	140,977 72.47%	226,039 53.52%
Total	87,846 100%	139,967 100%	194,508 100%	422,321 100%

(Source: Taken from Ministry of Education, 1998, Education Statistics Abstract, Table 5-3, p. 19.)

In terms of subject preference, females were overrepresented in Humanities and Social Sciences, but underrepresented in Science and Technology. The difference between male and female numbers in junior colleges, is not dissimilar to that in universities and colleges. These statistics are reproduced in Table 3.

Table 3
The Number and Percentage of Students Enrolled in Junior Colleges by Gender and Subject in 1996/97

	Humanities	Social Sciences	Science & Tech.	Total
Females	16,738 77.63%	105,905 83.17%	109,522 38.44%	232,165 53.51%
Males	4,825 22.37%	21,444 16.83%	175,431 61.56%	201,700 46.49%
Total	21,563 100%	127,349 100%	284,953 100%	433,865 100%

(Source: Taken from Ministry of Education, 1998, Education Statistics Abstract, Table 5-7, p. 21.)

The fact that more females are entering non-university institutions rather than university institutions can be seen in Figure 2, where the distinct tendency in female participation in different institutions of higher education from 1970-1999 is reflected in the two approximately parallel curves indicating the number of females in university and college sectors and junior college sector respectively.

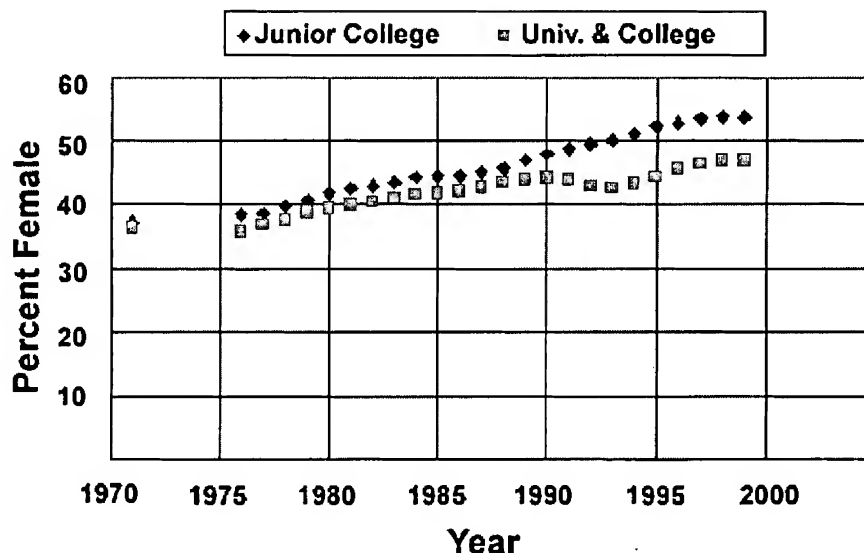


Figure 2. The Percentage of Females in Universities and Colleges,
as well as Junior College by School Year from 1970-99.
(Source: Ministry of Education, 2000a, Education Statistical Indicators, p. 33.)

Although there will be a variety of reasons why the percentage of females attending junior colleges is higher than that of females in institutions of higher education and while each stands in need of further investigation, what is relevant to this paper is that this difference has obvious implications for any examination of the issue of access for women. This is because the fact that there is a hierarchy of prestige among Taiwan's higher education institutions. Compared with universities and colleges, junior colleges in Taiwan are seen as being inferior in terms of prestige. This in turn reflects upon the perceived status of the qualifications awarded. If women continue to be underrepresented at university level, the gender gap, therefore, can still be seen to exist in terms of institutional difference.

Family attitude may have exerted a negative influence on females' entrance to higher education. Moore (1987) claimed that families in Western Europe and North America have tended to favour the attendance of male children but not female children in higher education, especially when a financial burden is involved. This varies considerably, based on class and ethnic origin as well. However it is quite common for female students to choose not to pursue higher education, or only a limited course within it, as a result of family attitudes.

Female Access to Advanced Study for a Master's Degree or a Doctor's Degree

The topic of females' participation in higher education would not be complete without regard to access of females to advanced study for a master's degree or a doctor's degree. It is very disappointing to find that females are still lagging behind in their access to advanced study. The information outlined in Table 4 indicates that during the period of 1991-1997 females in Taiwan made up only 16 per cent of the total doctoral graduates and 25 per cent of master's graduates, in spite of females comprising as high as 48 per cent of the total bachelor's degree graduates during the same period. This has shown that across all degree levels of higher education there is a tendency that the higher the degree level is, the fewer females there are.

Table 4
Higher Education Graduates by Gender, School Year 1991-1997

	Ph.D. Degree	MA Degree	BA Degree
1991			
Male	518	5,883	28,380
Female	90	1,805	25,995
1992			
Male	578	6,857	30,424
Female	100	2,160	29,054
1993			
Male	684	7,855	33,221
Female	124	2,593	29,939
1994			
Male	725	8,807	37,357
Female	123	2,899	30,466
1995			
Male	876	9,532	38,515
Female	177	3,117	32,233
1996			
Male	995	9,948	39,347
Female	192	3,368	34,908
1997			
Male	1,043	10,355	42,369
Female	239	3,791	43,433
Total	6,464	78,970	475,641
Male	5,419	59,237	249,613
Female	1,045	19,733	226,028
(%)	(16%)	(25%)	(48%)

(Source: Ministry of Education, 1999, Statistics on Higher Education Graduates in the R.O.C., School Year, 1992-1997, p.5.)

Female Choice of Subjects to Study

Let us move on to look at significantly differing subject preferences between males and females. As far as subject preference is concerned, there is a significant distinction between males and females seeking admission for university and college in Taiwan. It is interesting to note that the success rate for admission to the Social Sciences and Humanities as a whole was 54.78 per cent compared to a 66.87 per cent success rate in admission to the Science and Technology. It is important to consider that the number of applicants (68,778) for places in the Social Sciences and

Humanities exceeds the number of applications to the Science and Technology (14,753). This in effect means that women will find it more difficult to gain admission in the Social Sciences and Humanities. (See Table 5).

Table 5
Gender Differences in Admission to University and College by Division in 1998

Division	Applicants			Passers			Admission (%)		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Social Sciences & Humanities	67,874	26,202	42,576	37,676	13,889	23,787	54.78	53.01	55.87
Science & Tech.	14,753	13,243	1,510	9,865	8,847	1,018	66.87	66.81	64.42

(Source: Ministry of Education, 2000b, *Education Statistics of the Republic of China*, p. 39.)

These facts suggest that women, due to their differing preference in subjects of study, have still suffered some disadvantages in terms of entrance into higher education in Taiwan in the past. A solution may be found if attention is focused on two main areas (Thomas, 1988): First, the socialisation processes that currently affect gender roles in education. For instance, an attempt should be made to change the traditional values that dominate gender, role and opportunity, whereby men are regarded as more appropriate for scientific work and women are seen as fitted for social work. Second, a greater range of subjects should be offered to girls at secondary education level. Another possible solution would be to increase the places available for study in the social sciences and humanities.

Concluding Remarks

Based upon this examination of the data, it appears that all the evidence so far presented has clearly indicated that in Taiwan females do stand less chance of obtaining access to higher education. First, in terms of institutional type, females are entering less prestigious non-university institutions (i.e., junior college in Taiwan) rather than universities. Second, males stand a better chance of being accepted than females, largely as a result of the remarkable difference shown in subject preference between males and females. Third, in terms of access to higher education, it is very disappointing to conclude that females are still lagging behind in their access to university, especially to advanced study. In conclusion, although the expansion of higher education in Taiwan has substantially benefited females over the past few decades, women still suffer disadvantages in access to higher education.

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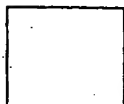


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